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The Experience of Principals at Catholic Schools Implementing a Pranayama Practice for Stress Coping

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THE EXPERIENCE OF PRINCIPALS AT CATHOLIC SCHOOLS IMPLEMENTING A PRANAYAMA PRACTICE FOR STRESS COPING

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UNIVERSITY OF SAN FRANCISCO
Dissertation Abstract

THE EXPERIENCE OF PRINCIPALS AT CATHOLIC SCHOOLS IMPLEMENTING A PRANAYAMA PRACTICE FOR STRESS COPING

This study explored and documented the experiences of Catholic School principals in Northern California who implemented a one-month pranayama (yoga breathing) practice to help reduce their stress. The participants, four men and three women, were primary and secondary school principals at Catholic schools, including both diocesan and independent Catholic schools. This study utilized an embedded mixed methods design in which both qualitative and quantitative data were collected concurrently. Participants were asked to practice Ujjayi pranayama for eight minutes a session four times per day. Participants took the Administrator Stress Index and Perceived Stress Scale at the start of the intervention and again after it was completed. They also kept a breathing, stress, and coping journal and answered questions in an interview.

The findings included a significant correlation between average minutes per day of Ujjayi pranayama and reduction in perceived stress as measured by the Perceived Stress Scale. Four principals experienced an encouraging decrease in perceived stress after the intervention, two principals showed mixed results, and one principal had a clear increase in perceived stress. The following themes emerged most clearly from the interviews about their experiences of practicing pranayama: 1) Novelty of Pranayama, 2) Adjustment Period to the Practice, 3) Ease of Implementation, 4) Alone Time, 5) Benefits of Practice, 6) Obstacles to the Practice, 7) Shorter Breathing Sessions, and 8) Counting the Breath. The following themes presented themselves from the comparison of pranayama to their other coping techniques: 1) Ambivalence, 2) Complementary Benefit, 3) Efficiency, 4) Ease of Location, and 5) Discipline. The principals'

responses fell into the following four themes about their emotional narratives: 1) No Change, 2) Reduced Emotion, and 3) Increased Emotion. Finally, there were three categories of stressors that principals felt were particular to Catholic school principals: 1) Archbishop-based Stress, 2) Mission-based Stress, and 3) Financial Stress. Six out of the seven principals had very positive feelings towards the pranayama intervention and reported benefits ranging from increased relaxation and calm, better focus, better sense of pace, and reduced negative emotions. Because the pranayama practice reduced both anger and anxiety in principals, it was a useful tool for both emotion regulation and stress reduction.

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

Scott Christian Roos	November 16, 2016
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by their dedication to Catholic education, and they are indeed paragons of what it means to be a Catholic principal.

TABLE OF CONTENTS

ABSTRACT…….. ii

SIGNATURE PAGE……. iv

ACKNOWLEDGEMENTS…….. v

LIST OF TABLES ……... xi

LIST OF FIGURES …….. xiii

CHAPTER ONE: THE RESEARCH PROBLEM …….. 1
Statement of the Problem…….. 1
Background and Need for the Study…… 4
Purpose of the Study…… 7
Research Questions …….. 7
Limitations …… 9
Educational Significance …….. 11
Theoretical Framework ……12
Definition of Terms …….. 14
Summary……16

CHAPTER TWO: THE REVIEW OF LITERATURE……18
Restatement of the Problem ……..18
Overview of Review of Literature …… 18
Stress: History and Overview ……... 19
Principals and Stress …… 30
Principals and Coping ……...44
Yoga and Stress …… 54
Pranayama and Stress ……63
Stress, Emotions, and Yoga …….. 71
Breath, Formation, and Catholic Schools …… 80
Summary…… 83

CHAPTER THREE: METHODOLOGY…….…… 85
Restatement of the Purpose …….. 85
Research Design…… 85
Population and Sample …… 87
Instrumentation …… 88
The Administrator Stress Index…… 90
The Perceived Stress Scale …….. 92
Data Collection …… 93
Data Analysis ……96
Reliability and Validity …… 98
Ethical Considerations ……..99

Background of the Researcher ……..99

CHAPTER FOUR: FINDINGS…… 101
Research Questions……101
Research Question 1……...…… 101
Principal 1……..102
Summary of Principal 1……107
Principal 2……..107
Summary of Principal 2……110
Principal 3……..111
Summary of Principal 3……115
Principal 4……..115
Summary of Principal 4……120
Principal 5……..121
Summary of Principal 5……126
Principal 6……..126
Summary of Principal 6……131
Principal 7……..132
Summary of Principal 7……136
Summary of all principals…… 137
Research Question 2……...……... 140
Novelty of pranayama……...……140
Adjustment period……...…….. 141
Ease of implementation……...…….. 142
Alone time……...…….. 143
Benefits of practice……...……. 144
Good feeling……...…… 144
Relaxation/calm……...…….. 145
Better pacing……...…… 147
Reduced negative emotions…..…… 148
Increased focus……...…… 149
Miscellaneous benefits……...…… 151
Obstacles to the practice……...…….. 151
Allergies……...……...151
Falling asleep……...…….. 152
Outside interruptions……...……... 152
Difficulty producing the Ujjayi sound……... 154
Difficulty lengthening the inhale…..……. 154
Difficulty slowing down the breath..…… 155
Lack of discipline……...…….. 155
Lack of time……...…….. 157
Shorter Breathing……...……158
Counting……...…… 159
Research Question 3……...…… 163
Ambivalence……...…… 167
Complementary benefit……...…… 168

Efficiency……170
Ease of location……170
Discipline……171
Summary……172
Research Question 4……172
No change……174
Reduced emotion……175
Anger……175
Anxiety……176
Intensity of emotion……178
Increased Emotion……180
Access……180
Levity……180
Research Question 5……181
Archbishop-based stress……183
Threat of Archbishop regulation……183
Defending Catholic reputation……184
Mission-based stress……185
Community building……186
Whole person formation……187
Financial-based stress……189
Fundraising……189
Enrollments……190
Summary……192

CHAPTER FIVE: CONCLUSIONS……194
Summary of the Study……194
Conclusions and Implications……195
Research Question 1……195
Research Question 2……198
Research Question 3……201
Research Question 4……203
Research Question 5……205
Recommendations……207
Recommendations for Future Research……207
Recommendations for Future Practice……209
Closing Remarks……211

REFERENCES……213

APPENDICES
Appendix A: Letter to Principals……234
Appendix B: Permission to Use the Administrator Stress Index……236
Appendix C: Permission to Use the Perceived Stress Scale……237
Appendix D: The Perceived Stress Scale……238
Appendix E: Google Sheets Journal Template……240

Appendix F: The Administrator Stress Index …… 241
Appendix G: Participant Consent Form ……244
Appendix G: IRB Approval …… 247

LIST OF TABLES

Table 1: Summary of Stress Theories……... 28

Table 2: Top 10 Stressors from Gmelch & Swent (1977)…… 31

Table 3: Summary of Highest Stressors in Principals according to the ASI..…….. 40

Table 4: Coping Preference Scale from Roesch (1979)…… 47

Table 5: Coping Response Inventory from Gmelch (1988)…….. 48

Table 6: Coping Factors from Allison (1997) …… 50

Table 7: Reclassifying Coping from Nes and Segerstrom (2006)…… 54

Table 8: Research Questions and the Sources of Data for their Answers……. 97

Table 9: ASI and PSS Quintiles with Descriptors ……..…….. 102

Table 10: Principal 1 Survey Results and Breathing Log Data…….……... 102

Table 11: Principal 2 Survey Results and Breathing Log Data…….…… 107

Table 12: Principal 3 Survey Results and Breathing Log Data…….…… 111

Table 13: Principal 4 Survey Results and Breathing Log Data…….…… 116

Table 14: Principal 5 Survey Results and Breathing Log Data…….…… 121

Table 15: Principal 6 Survey Results and Breathing Log Data…….…… 127

Table 16: Principal 7 Survey Results and Breathing Log Data…….…… 132

Table 17: Summary of Demographic Data …….…….…….…. 137

Table 18: Summary of the Results of All Principals…….…….……138

Table 19: A Table of Pearson's Correlations.…….…….……..139

Table 20: Summary of Themes for Research Question 2…….…….162

Table 21: Coping Responses from Breathing Logs and Interviews…….……. 163

Table 22: Emotions recorded in Breathing Logs…….…….…….173

Table 23: Themes and Sub-themes of Emotional Experience from Interviews ……... 174

Table 24: Top 10 Stressors on the ASI for Seven Catholic School Principals…… 181

Table 25: Additional Stressors for Catholic School Principals…….…… 183

LIST OF FIGURES

Figure 1: Summary of Yoga's Benefits in the Stress Response……..... 60

Figure 2: Revised Transactional Model of Stress to Include Emotions…….72

Figure 3: Framework of Emotion Processes in the Workplace……. 75

CHAPTER ONE

THE RESEARCH PROBLEM

Statement of the Problem

Principals are suffering from high levels of stress from increased expectations for student achievement, access to only limited resources, changing demographics, and expectations of instant access via email and text from parents, board members, and faculty (Wells, 2013) and the stress experienced by these school principals leads to burnout, illness, and high early-retirement rates (Allison, 1997; Olsen, 1984; Sogunro, 2012; Sytsma, 2009). Principals in the last century were already experiencing more aggression, conflict, change, and health problems than those in previous years (Gmelch, 1978), and the situation for principles is getting worse because of the increased demands that the 21st Century is making on principals, including instructional and transformational leadership and multifarious performance expectations (Wells, 2013). The increased expectations and the expanding complexity of the job have been linked to increased levels of stress (Combs & Edmonson, 2010; Sogunro, 2012). Because administrators are working more hours per week, their levels of stress are increasing (Andreyko, 2010), and school leaders who are under lots of stress create school cultures that are under stress as well (Sogunro, 2012).

Roesch (1979) concluded that stress was of great concern to administrators. Not only does job related stress account for the majority of the stress experienced by a principal, but job stress also correlates with burnout in principals (Olsen, 1984; Gmelch & Torelli, 1993; Shumate, 1999), with burnout being the result of the buildup of ongoing occupational stressors (Maslach & Jackson, 1981; Maslach & Leiter, 2008). Combs and Edmonson (2010) saw burnout as both “an

extreme form of job stress" (p. 437) and an inability to cope with stress, and they identified apathy, chronic fatigue, anxiety, and helpless as some of its manifestations. Scholars have categorized burnout into three subsets: emotional exhaustion; depersonalization, which includes negativity and cynicism, especially about one's employees; and lack of personal accomplishment, which consists of negative self-appraisals and job dissatisfaction (Andreyko, 2010; Maslach & Jackson, 1981). Shumate (1999) discovered in her sample that 73%, 59%, and 61% of administrators experienced moderate to high level of burnout in emotional exhaustion, depersonalization, and personal accomplishment respectively. In a more recent study of 52 principals in Connecticut, Sogunro (2012) found that 96% of the sample were experiencing stress at level that they believed was negatively impacting their productivity, work habits, and mental and physical health. Furthermore, stress in principals was high irrespective of the size of their school, the size of the district, administrative experience, age, or gender (Bradley, 2003; Monroe, 2007; Roesch, 1979; Welmers, 2005), i.e. the principal's job is stressful--period.

Stress happens when an individual perceives that his or her adaptive capacity cannot meet demands along with an anticipation of negative consequences of that inadequate response (Gmelch & Swent, 1984), and the resulting negative affective states affect biological and behavioral processes that influence the risk for disease (Cohen, Janicki-Deverts, & Miller, 2007). Executives who have high stress also manifest decreased productivity, more absenteeism, lower morale, and more interpersonal conflicts; and stress alters their behavior and unfavorably affects work output (Vedamurthachar, Damodaran, Lakshmanan, & Kochupillai, 2013). Principals who fail to cope with stress may experience physical, mental, or behavior illness and may experience burnout, with high stress best predicting emotional exhaustion (Gmelch, 1988). Chronic stress,

by changing emotional, physiological, and behavioral responses in the body, is thought to play an integral part in the development of diseases (Cohen, Janicki-Deverts, & Miller, 2007).

Even Roman Catholic sisters who performed school administrative duties reported high stress levels, had more absenteeism, and showed higher levels of mental, physical, and emotional exhaustion (Costello, 1981). Catholic school principals have situations specific to their context that may operate as additional stressors: relationship to a supervising member of the clergy, mission-driven decision making, the conflict between desiring diversity and desiring full-paying students, and maintaining a Catholic ethos in the face of non-Catholic faculty or student body (McLaughlin, O'Keefe, & O'Keeffe, 1996). Catholic school principals who discussed their experiences reported stress as one of the drawbacks to their jobs (Fraser & Brock, 2006).

Pranayama refers to the regulation of breath and breath exercises in the yoga tradition (Hayes & Chase, 2010). Ujjayi pranayama, which means "victorious breath" and is sometimes called "ocean breath" because the sound produced by the individual is analogous to that of the sea may function to reduce potential strains that occur as a result of a stress appraisal (Brown & Gerbarg, 2005). Pranayama helps reduce the stress response by creating an inward focus that quiets the external stress stimulus and by modulating the triggers that activate the sympathetic nervous system (Hayes & Chase, 2010). Because of pranayama's ability to shift the autonomic nervous system away from sympathetic dominance towards parasympathetic dominance, pranayama can be used as an effective tool for treating stress and stress related diseases (Jerath, Edry, Barnes, & Jerath, 2006). Yoga practices that combine postures with pranayama have been shown to reduce both perceived stress (Satyapriya, Nagendra, Nagarathna, & Padmalatha, 2009; Semich, 2012; Waelde, Thompson, and Gallagher-Thompson, 2004) and physiological indicators

of stress (Kamei, et al., 2000; Streeter, Whitfield, et al., 2010). Pranayama practice done in a sitting position has also been studied extensively vis-a-vis stress, and studies have demonstrated that regular pranayama practice reduces both perceived stress (Bhimani, Kulkarni, Kowale, & Salvi, 2011; Sharma, Rajajeyakumar, et al., 2014; Sharma, Takroo, et al., 2013) and physiological indicators of stress (Driscoll and Dicicco, 2000; Ghiya and Lee, 2012; Hayano et al., 1994; Singh, Gaurav, & Parkash, 2011; Srivastava, Jain, & Singhal, 2005; Subbalakshmi, Saxena, Urmimala, & D'Souza, 2005; Upadhyay Dhungel, Malhotra, Sarkar, & Prajapati, 2008). Sytsma (2009) suggested that inner work was needed for principals to enable a sustainable leadership, and this study investigated whether a pranayama intervention for principals at Catholic schools was the inner work needed to sustain them through their stressful job.

Background and Need

Catholic documents support the notion that educators should not be overwhelmed. The Sacred Congregation for Catholic Education stated that the work of education "requires calm, interior peace, freedom from an excessive amount of work, continuous cultural and religious enrichment" (1982). Benedict XVI stated that "we must do whatever we can to reduce suffering... to give assistance in overcoming mental suffering. These are obligations both in justice and in love, and they are included among the fundamental requirements of the Christian life and every truly human life" (2007). In fact, the Church has stated that it condemns situations in which a person's dignity is violated and cautions that people should not experience a lowering of their dignity at work (John Paul II, 1981). In its encyclical on the rights of workers, the Church warned that "daily labor . . . should be so regulated as not to be protracted over longer hours than strength admits" and that "there should be allowed proper rest for soul and body" (Leo

XIII, 1891). With even the most effective principals experiencing the same amount of stress as their colleagues (Bailey, Fillos, & Kelly, 1987) and with principals averaging a 58 hour work week (Carson, 2010), principals need to find a way to reduce their stress and restore their dignity.

Formation is at the heart of Catholic education, and the principal is included in that call to formation (USCCB, 2005). Formation includes "competency in a wide range of cultural, psychological, and pedagogical areas" (Sacred Congregation for Catholic Education, 1982), and educators are called to develop their knowledge and update their methodologies (Sacred Congregation, 2007). Indeed, the Church claims to embrace "methods of science and all sorts of profane culture" (Pius XI, 1929). Coping refers to cognitive and behavioral attempts to reduce psychological stress (Onwuegbuzie, Jiao, & Collins, 2007), and Andreyko (2010) advised that principals be taught a variety of coping strategies so that they do not quit and so that others will enter the profession. However, despite the exhaustive research that exists on principals and stress, there is very little research on the effectiveness of coping strategies for principals (Wells, 2013). Gmelch (1988) identified 2000 coping techniques used by 1200 administrators and recommended that the best coping happens with individuals who have a repository of techniques to draw from. One such coping method that is showing promising results and offers stress-reducing possibilities is pranayama, or yogic breathing.

Yoga, having originated in the contexts of spiritual traditions of India, aims to eradicate the causes of suffering (Kraftsow, 2002). It is a multicomponent system that focuses the energies of the mind and body, whose goal is to create a state of being wherein a person lives in the present moment with less stress and more inner peace (Semich, 2012). Yoga exists as one of

the many practices under the umbrella of mindfulness: non-judgmental awareness in the present moment (Wells, 2013). Pranayama, one of the techniques in the arsenal of yoga, refers to the regulation of breath and specific breath exercises (Hayes & Chase, 2010). Kraftsow (1999) claims that pranayama was developed to balance the emotions and clear the mind. Pranayama has been shown to decrease the physical manifestations of stress: heart rate, blood pressure, and pulse pressure (Sharma et al., 2013). In addition, Bhimani, Kulkarni, Kowale, and Salvi (2011) demonstrated that individuals who practiced two months of pranyama had both reduced perceptions of stress as well as reduced physiological indicators of stress. Yoga practice has been shown to reduce both stress and anxiety, to improve health, and to prevent and manage disease (Sengupta, 2012), and yoga practice that included pranayama in addition to the physical postures (*asanas*) reduced perceived stress more than *asanas* alone (Semich, 2012). Vedamurthachar, Damodaran, Lakshmanan, and Kochupillai (2013) showed that pranayama combined with Sudarshana Kriya, a specialized breathing, chanting, and meditation technique from the Art of Living Society, successfully reduced perceived stress in executives. Because pranayama can be practiced in short increments of time and because it has had success with other executive types, it may offer principals an effective coping technique for their stress.

Searching in the ERIC database, this researcher was able to find no articles in which principles used pranayama as a coping technique: searches of "principal pranayama" and "principal breathing" yielded zero relevant results. Wells (2013) calls attention to the fact that there is a dearth of research on principals and coping, but also suggests that mindfulness techniques be used as coping techniques for principals. In performing a literature review on yoga techniques and anxiety, Kirkwood, Rampes, Tuffrey, Richardson, and Pilkington (2005)

excluded dissertations because they lacked details on methodology and outcome measures and found only eight controlled clinical trials, many of which contained inadequate reporting and other methodological problems. Furthermore, much of the research on yoga has been done in India where its cultural acceptance may influence outcomes (Greenberg & Harris, 2012). Many studies that claim to study pranayama specifically conflate pranayama with other techniques such as meditation, visualization, mantra, or postures (e.g., Nemati, 2013; Semich, 2012). In short, more research that explores pranayama as coping techniques for principals is needed.

Folkman and Moskowitz (2004) argued that for any coping technique to be studied properly, it must be studied in a particular stressful context because what may work in one context may not be effective in another context. Furthermore, because a context is dynamic, what may work at the start of a stressful situation may not work at the end, and vice versa. Thus, this study sought to evaluate whether pranayama could function as a useful and effective coping technique in the context of principals of at Catholic schools.

Purpose

The purpose of the study was to explore the phenomena of principals at Catholic schools implementing a pranayama practice, including investigations into the principals' perceptions of its utility as a coping technique, the change in the principals' perceptions of the sources of stress and levels of stress, their narrative of their emotional experience vis-a-vis their perceptions of stress, their perceptions of any sources of stress that may be unique to Catholic schools.

Research Questions

The following questions guided this study:

1) To what extent is there a change in perceived stress after the pranayama intervention?

A. To what extent is there a change in the perceptions of stress, as measured by the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983)?

B. To what extent is there a change in the appraisal of the sources of stress, as measured by the Administrative Stress Index (ASI) (Swent, Gmelch, & Oregon School Study Council, 1977).

C. To what extent is there a change in the appraisals of stress and the sources of stress, as indicated by themes in the interview.

2) What was the experience of the pranayama practice for Catholic school principals as indicated by themes in the interviews and notes in the journals?

A. To what extent were there facilitators of or hindrances to practice?

B. What are the principals' attitudes towards the pranayama practice? Would they recommend the practice to other administrators, teachers, or students?

C. To what extent are principals able to slow the ratio of the breath (i.e., decrease cycles per minute) in pranayama practice.

D. Were there any aspects of the practice that were particularly difficult or easy for principals (e.g., lengthening inhale, hold after inhale, lengthening exhale, hold after exhale, producing the Ujjayi sound)?

E. To what extent does the practice affect attentional control, disengagement, and freedom from rumination?

3) What other coping techniques do principals at Catholic schools use and how do the principals compare the effectiveness of the pranayama practice to other coping techniques?

4) What narratives are the principals able to tell about their emotions during the intervention? Is their emotional state different after the intervention? To what extent does pranayama help with emotion focused coping and emotion regulation?

5) To what extent are there additional sources of stress for principals at Catholic schools?

Limitations

The sample size of eight participants was a limitation of the study. For generalizable results in a quantitative study, a sample size of at least 20 is needed. However, a simple random sample was not the purpose of this study. The purpose of this mixed methods research project was to explore the phenomenon of a breathing intervention. The experiences of these principals at Catholic schools were not generalizable to principals at public schools or to principals at Catholic schools outside of the northern California region. Because the study has limited itself to principals, the results were not necessarily generalizable to other administrators, e.g., vice-principals or deans, to staff members, to faculty, to parents, to board members, or to students. San Francisco's particular social (with a bent towards social liberalism), economic (with a skew towards upper middle and upper class demographics), and particular cultural climate made generalizing to other populations in other cities and regions difficult. San Franciscans often have a positive view of yoga practices, and the principals in the study might have been predisposed to describe yoga practices in a positive light. Conversely, if a principal happens to be a conservative Catholic practitioner, he or she might have had a negative to practices that do not frequently appear in more common Catholic practice.

Another limitation was that the principals performed the interventions in different months, some in April and others in May, and took both sets of surveys at different times of the

school year, with some taking the second survey before the end of the school year and others after the end of the school year. The lack of simultaneity in the collection of data might have skewed some of the results from the stress surveys.

Participant time-constraints was another limitation of the study. Participants were not able to fully implement the intervention because of the nature of sporadic nature of the principal's schedule and because of the many demands placed on the these principals. Furthermore, because principals at Catholic schools are the face of Catholicism for those schools and because principals are at constant exposure for litigation or unwanted publicity, fear of exposure, of publicity, or of the wrath of a conservative archbishop might have limited the candor of some responses.

The use of an audio recording device in the interview process was another limitation because the audio recorder does not capture the finer nuances of facial expression, gesticulation, or body position. The researcher took notes after each interview in order to compensate for this limitation.

The Administrator Stress Index (ASI) was created 40 years ago (Gmelch & Swent, 1977), and as such it was slightly out of date. While the researcher has made some slight modifications to include email and texts into the survey, the age of the instrument was a limitation.

The researcher is a Registered Yoga Teacher (RYT) at the 500 hour level in the Viniyoga tradition and has practiced pranayama over the last 15 years. His bias as a Viniyoga practitioner could have impacted the data collection quality or the interpretation of the results of the data. The researcher was aware of his bias and has made every effort not to let his desire for positive outcomes influence his duty to research impartially.

Educational Significance

Principals who experience excessive stress may not be able to do their job well. Task-based stress is the biggest predictor for administrator burnout (Gates & Gmelch, 1998), and administrators who experience both the emotional exhaustion and the depersonalization that results from burnout perform less effectively in tasks, conflict management, and boundary spanning areas (Gmelch & Chan, 1992). Furthermore, stress negatively impacts decision-making. Pabst, Schoofs, Pawlikowski, Brand, and Wolf (2013) reported both that stress alters the prefrontal region of the brain and consequently affects executive functioning and that stress correlates with inflexibility, failure to properly assess alternatives, and riskier decision-making. The suppression of emotions that are associated with stressful events can further exacerbate negative outcomes, including producing poorer memory and thought processes as well as decreased social functioning (Lawrence, Troth, Jordan, & Collins, 2011), and emotionally exhausted principals spend significantly less time on curriculum (Combs & Edmonson, 2010). With Shumate (1999) reporting that 73% of participant principals experienced mid to high levels of emotional exhaustion and with Gmelch and Chan (1992) reporting that almost 27% of their sample claimed to have high stress from tasks, finding effective coping techniques for principals becomes paramount to supporting better health, improved work performance, and effective leadership of our principals.

Secondly, pranayama is a technique that is practiced with mindfulness, which is intentional, non-judgmental, in-the-moment attention (Kabat-Zinn, 1994; Sharma, 2007). Principals who practice pranayama may be increasing their mindfulness (Wenger, 2012). Having higher mindfulness has been linked to both an unwillingness to perform unethical actions

and valuing high moral standards (Ruedy & Schweitzer, 2010). Longer mindfulness interventions, i.e. two months long, have shown to increase moral reasoning capabilities in adults (Shapiro, Jazaieri, & Goldin, 2012). Principals who practice pranayama not only may be making better decisions but also may be making more ethical ones. McDonald and Gates (2015) reported in an autoethnography that an administrator who practiced mindfulness nurtured calm, reduced the incidence of panic attacks, practiced breathing to prepare for difficult meetings, and became more responsive to challenging circumstances rather than mindlessly reactive. In short, the authors report that the mindful principal became a transformative leader rather than a reactive manager.

Principals who practice pranayama may teach and support the teaching of the technique to faculty, staff, and students. A regular pranayama practice has been shown to decrease test anxiety and increase academic performance (Nemati, 2013), and two aspects of mindfulness, non-reactivity and acting with awareness, correlate positively with GPA (Napora, 2013). The entire school could benefit from learning to breathe.

Finally, this study will add to the body of research about stress and the workplace, about stress and principals, about pranayama, and about Catholic schools. Very little research has been done to investigate the stress of principals in Catholic schools, and the researcher has found no research that evaluates pranayama as a coping technique for principals in Catholic schools.

Theoretical Framework

The theoretical framework for coping in this study was Brown & Gerbarg's (2005) Neurophysiologic Model of Ujjayi breath. The model posits that Ujjayi breath stimulates the parasympathetic nervous system and pacifies physiological indicators of stress via the following

five mechanisms: 1) slow breathing, 2) laryngeal contracture, 3) prolonged inspiration against airway resistance, 4) prolonged expiration against airway resistance, and 5) breath holding. These researchers reported that slow breathing of two to four cycles per minute (or one breath every 15 seconds to 30 seconds) increased low frequency heart rate variability, baroreflex sensitivity, exercise tolerance, and oxygenation; decreased chemoreflex sensitivity; and improved cardiovascular and respiratory function, all of which point to parasympathetic dominance and better overall health. Laryngeal contracture, i.e., partially closing the glottis to increase airway resistance, allows the practitioner to more easily lengthen the inhale and exhale, and the researchers postulated that this action in the back of the throat also activates the vagal nerve, the primary nerve of the parasympathetic nervous system. Inspiration and expiration against airway resistance also allows the practitioner to lengthen the breathing cycle and has been shown to activate vagal signaling to the brain. The researchers also postulated that breath holding, i.e., the pausing of the breath after inhale or exhale, increases oxygen consumption and parasympathetic dominance.

During the stress response, the body activates the sympathetic nervous system, and after the stressful stimulus has passed, the parasympathetic nervous system restores the body to a more restful state (Hayes & Chase, 2010). Although no causal link has been firmly established, psychological stress is thought to affect the hypothalamic-pituitary-adrenocortical axis (HPA), which regulates anti-inflammatory responses and glucose metabolism and produces cortisol, and it is thought that prolonged stress can interfere with the HPA's functionality, leading to an increased risk for psychiatric and physical disease (Cohen, Janicki-Deverts, & Miller, 2007; Sengupta 2012). Yoga practice has been shown to decrease heart rate, blood pressure, salivary

cortisol, and blood glucose, suggesting that it calms the HPA axis's stress response (Ross & Thomas, 2010; Sengupta, 2012). Again, though the precise physiological mechanism has not been identified, yoga practices appear to shift the autonomic nervous system towards parasympathetic dominance, possibly by means of direct vagal nerve stimulation (the vagal nerve is the primary nerve of the parasympathetic nervous system) (Jerath, Edry, Barnes, & Jerath, 2006; Sengupta, 2012). Thus, pranayama may function by deactivating the body's biological response to stress.

Definition of Terms

The following terms are used throughout the study and are defined below:

Anxiety is "an emotion characterized by feelings of tension, worried thoughts, and physical changes" (American Psychological Association, n.d.).

Asana originally meant the seated pose of meditation but now more generally refers to the physical exercises and postures of the modern yoga practice (Hayes & Chase, 2010).

Autonomic Nervous System is the "part of the nervous system which regulates the bodily functions that are not under conscious control….[it] consists of two main divisions -- the sympathetic nervous system and the parasympathetic nervous system" (Marcovich, 2011).

Burnout is "a syndrome of physical, emotional, attitudinal exhaustion, and cynicism that occurs frequently among individuals who do 'people work' of some kind" (Costello, 1981, p. 15).

Coping is "the constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141).

Mindfulness is "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally. This kind of attention nurtures greater awareness, clarity, and and acceptance of present moment reality." (Kabat-Zinn, 1994, p. 4).

The *Parasympathetic Nervous System* is "that part of the autonomic nervous system which is connected to the brain and spinal cord through certain nervous centers in the midbrain, medulla, and lower end of the cord. . . . The action of the parasympathetic nervous system is usually antagonistic to that of the sympathetic nervous system. Thus, it inhibits the action of the heart and augments the action of the intestine" (Marcovich, 2011).

Perceptions of Stress are the individuals' subjective thoughts and feelings about their experience of stress and must be differentiated from *Physiological Indicators of Stress*, which are objective biological indicators that the person has experienced stress, e.g., cortisol and inflammatory markers.

Pranayama is "the manipulation of vital energy through the regulation of breath and specific breath exercises, referencing a belief that energy (prana) circulates in the body through subtle channels (nadis)" (Hayes & Chase, 2010, p. 33). Pranayama can be practiced in any *asana* but is most often practiced in a comfortable seated position (Kraftsow, 2002).

A *Principal* is an administrator at an elementary, middle, or high school who leads a division; a head of school at an elementary, middle, or high school.

Stress is psychological stress, as opposed to stress from trauma or illness, and psychological stress "is a particular relationship between the person and the environment that is appraised by that person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19).

The *Sympathetic Nervous System* is "part of the autonomic nervous system. . . . The chief part of the sympathetic nervous system consists of two ganglionated cords that run through the neck, chest, and abdomen, lying close in front of the spine." (Marcovich, 2011). This system usually becomes active as a result of stress.

Ujjayi Pranayama is also called "victorious breath" or "ocean breath" because the sound produced is reminiscent of the ocean (Brown & Gerbarg, 2005). It involves a glottal contraction in the back of the throat in which the flow of air is effectively valved and a sound is produced.

Viniyoga is "A highly therapeutic and usually gentle system, in which poses and practices are adapted to the individual based on the needs of the student and the diagnosis of the teacher. Students flow from pose to pose, holding only briefly. Pranayama and chanting are often incorporated throughout." (Hayes & Chase, 2010).

Yoga is an "ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. . . . [It] was systematized by Patanjali in the Yoga Sutras (300–200 B.C.). Patanjali defined the purpose of yoga as knowledge of the true 'Self' (God) and outlined eight steps for direct experience of 'Self'" (Sengupta, 2012).

Summary

Principals of both public schools and Catholic schools are experiencing stress and the deleterious consequences of stress. Catholic documents have declared that workers and educators should not be overwhelmed by their jobs, and coping techniques can be seen as a call to formation. Pranayama, which has been shown to reduce both perceptions of stress and the physiological indicators of stress in other populations, may be an effective coping technique for principals at Catholic schools. The literature review in the next chapter touches on the history of

stress research, the research on stress and coping for principals, the evidence for yoga's and pranayama's effectiveness in reducing stress, the most recent theories linking emotions to stress, and the Catholic documents that pertain to formation and Catholic schools. The Chapter III covers the methodology for the study: a mixed-methods intervention in which Catholic school principals will be asked to practice pranayama four times a day for a month. These principals took stress surveys both before and after the intervention and were interviewed about their experiences after the intervention. Chapter IV reports the findings from the surveys and the coding of themes from both the journals and interviews. Chapter V includes my conclusions from the findings and my recommendations for both research and practice.

CHAPTER TWO

REVIEW OF THE LITERATURE

Restatement of the Problem

The problem is that principals are suffering from high levels of stress because of the instant access demands of parents, board members, and faculty that is afforded by technology; the changing demographics of their schools; the limited resources that many principals have access to; the expectations for both instructional and transformational leadership; sundry performance expectations; and the increased expectations of student achievement (Well, 2013). High levels of stress often leads to absenteeism, decreased productivity, more interpersonal conflicts (Vedamurthachar, Damodaran, Lakshmanan, & Kochupillai, 2013), and failure to cope with stress can lead to physical or mental illness or burnout (Gmelch, 1988). High levels of stress also correlates with a failure to assess alternatives, riskier decision-making, and inflexibility (Pabst, Schoofs, Pawlikowski, Brand, & Wolf, 2013). Because of the negative consequences of stress, principals need effective methods to cope with stress, and both yoga and pranayama have demonstrated themselves to be effective techniques in the treatment of stress (David, 2013; Ghiya & Lee, 2012; Hayes & Chase, 2010; Joshi & DeSousa, 2012; Semich, 2012; Vempati & Telles, 2000).

Overview of the Review of Literature

This review of literature incorporated articles and books from several different disciplines because of the multi-disciplinary approach of this project. Stress research is a truly enormous field, with over 100,000 publications having been published on the topic by 1994 (Gmelch & Chan, 1994). Current estimates include over 350,000 articles about stress in the 21st century

(Montefuscio & Barnes, 2011). This review of the literature limited itself to a discussion of a brief history of the field of stress research and then focused on the research around principals and stress. The review then recapitulated the studies that focus on coping, with special emphasis on those studies that have looked at coping techniques for principals. Next, because of the nature of the coping intervention, the review unpacked the research that pertains to mindfulness and stress; yoga and stress; pranayama and stress; and emotions, yoga, and stress. Finally, the review looked into how breathing relates to Catholic formation, Catholic symbolism, and Catholic schools.

Stress: History and Overview

Selye (1976) outlined a brief history of the research on stress. His basic question was "why [do] patients suffering from the most diverse diseases have so many signs and symptoms in common" (Selye, 1976, p. 3). His answer involved the supposition that diseases put stress on the body, and the body has consistent stress response called the General Adaptation Syndrome (GAS), which also has the name biological stress syndrome. In this model, the body has three reactions to a noxious agent: 1) an alarm reaction, 2) stage of resistance, and finally 3) a stage of exhaustion. The final stage suggests that the body's ability to fight off a noxious agent is limited. Because an individual is responding to a stimulus that is stressful much like the mechanical stress that a bridge experiences after having many cars drive across it, Selye's theories have been categorized as the Stimulus Response Theory of stress (Hobfoll, Scharzer, & Chon 1998).

Selye (1982) acknowledged the American physiologist Cannon who coined the notion of homeostasis as an inspiration for his own work. Cannon defined homeostasis as "the

coordinated physiological processes which maintain most of the steady states in the organism" (Cannon, 1939, p. 333, as quoted in Selye, 1982). Cannon's research on how the body maintains its internal processes in the face of external environmental change inspired Selye to develop his theory of General Adaptation Syndrome (GAS), i.e. the body's response to dissimilar diseases was the same, namely, weight loss, anorexia, weakness, and diminished ambition.

Drawing on the theory of homeostasis and expanding his own theory, Selye (1982) outlined two basic responses to stressors: the syntoxic response, in which the person reacts with passive tolerance, and the catatoxic response, in which the person reacts with aggressive resistance. These responses have both physiological and psychological manifestations. He defined stressors as "agents or demands that evoke the patterned response [of GAS]" (Selye, 1982, p. 14), and he included both physical causes, including trauma and infections, and psychological causes, including joy, anger, and fear.

The expanded theory embraced by other researchers as well (e.g., Holmes & Rahe, 1967; McGrath, 1970) became known as the Homeostasis Model of stress in which stressors, whether positive or negative, become instrumental in the disease process when individuals fail to adapt to or cope with the stress. These theorists argued that any change in routine, whether it be marriage, divorce, change in job, new school, new friendship, new sport, etc., will lead to disease if it exceeds the body's limited ability to handle stress (Shumate, 1999). Selye (1982) delineated two categories of stress: eustress, "the pleasant stress of fulfillment" and distress, "damaging stress" (p.16). However, this theory has not been completely supported by the research because events viewed as positive seemed to be protective against illness (Hobfoll, Schwarzer, & Chon,

1998) and homeostasis research may have inflated the effects of undesirable events on psychological distress (Thoits, 1981).

Lazarus (1966) is credited with developing the Cognitive Appraisal Theory of Stress, which is also termed the Stimulus-Organism-Response (S-O-R) because the organism plays a part in its own stress response (Cooper & Dewe, 2004). In this model, the event itself is not the cause of stress, but the individual's appraisal of that event is what can cause stress (Lazarus & Folkman, 1984). In the primary appraisal, the individual judges an event as either harmful, threatening, challenging, benign, or beneficial and that a simultaneous secondary appraisal happens when the individual decides whether or not there are sufficient resources to cope with the event if it is appraised as stressful (Cooper & Dewe, 2004; Lazarus & Folkman, 1984). Personal factors, e.g., values, goals, motivations, and beliefs, as well as situational factors, e.g., an event's novelty, predictability, or timing, all affect an individual's appraisal of an event (Cooper & Dewe, 2004; Lazarus & Folkman, 1984). While Lazarus initially viewed appraisal as a deliberate and conscious action (Cooper & Dewe, 2004), he refined his theory later to incorporate the idea of the cognitive unconscious, "which has to do with matter that we attend or fail to attend and the influence of these events and ideas on thoughts, feelings, and actions" (Lazarus, 2006, p. 82) and added that appraisals can also be unconscious, with conscious appraisals becoming unconscious ones over time (Cooper & Dewe, 2004).

Coping becomes central to the theory, and Lazarus and Folkman define it as "constantly changing cognitive and behavioral efforts to manage specific external or internal demands that are appraised as taxing or exceeding the resources of a person" (p. 141). For them, coping is a process that can include re-appraisals of situation, attempts to change the environment, and

efforts to change the understanding of events. They included somato-physiological strategies like meditation, diet, and exercise as possible treatment protocols that work by affecting psychological processes. Hobfoll, Schwarzer, and Chon (1998) pointed out that in the case that the person judges either that the event is not threatening or that there are sufficient resources to cope with the event, stress does not happen.

Resource Theories of Stress, pioneered by Antonovsky (1979), differ from the Appraisal Theory of Stress in that it is not the appraisal of resources that matter, but rather the object reality of those resources, i.e, the presence of resources preserve health and protect against the disease caused by stress (Hobfoll, Schwarzer, & Chon, 1998). Dohrenwend and Dohrenwend (1981) compared advantaged and disadvantaged ethnic groups within social classes, found that problem drinking, antisocial personality, and schizophrenia were more predominant in the lower classes, and concluded that the lack of resources was the critical factor in experiencing negative outcomes of stress. Similarly, Allen & Britt (1983) suggested that the presence of both social and personal resources, both of which are connected to socio-economics, act as buffers against the negative effects of stress, i.e., the poor and the marginalized are more vulnerable because they do not have access to the same personal and social resources to cope with stressful events.

The Resource Theories of Stress have taken several different manifestations, and one subset of the model is called the Key Resource Theory in which a personal belief or trait manages the effectiveness of other resources and provides the resilience against the negative consequences of stress (Hobfoll, Schwarzer, & Chon, 1998). However, researchers differ about which key resource is the most influential in its ability to protect against stress, with some researchers rallying for optimism (Scheier & Carver, 1993), some for self-efficacy (Ozer &

Bandura, 1990), one for hardiness (Kobasa, 1979), and one for a psychological sense of coherence (Antonovsky, 1979), a tripartite resource model that consists of thinking that the world is benevolent, predictable, and meaningful (Hobfoll, Schwarzer, & Chon, 1998).

Another theory that falls under the aegis of the resource models of stress is the Resource Fit Model of Stress, which suggests that the amount of stress people feel depends on whether their resources fit the stressors produced by the environment (Hobfoll, Schwarzer, & Chon, 1998). French, Rodgers, & Cobb (1974) first introduced this line of inquiry as Person-Environment (P-E) fit theory. These theorists assessed the characteristics of the person and of the environment using comparable parameters, distinguished between objective and subjective measures in determining fit, and evaluated whether the person had the abilities to handle the demands of the workplace and whether the person's needs were met in the workplace (Caplan, 1987). French, Caplan, & Van Harrison (1982) applied P-E fit theory to stress research, suggesting that people experience stress when environmental needs do not match a person's resources. Cutrona & Russell (1990) took a slightly different approach and sought to understand which forms of social support were most beneficial in helping the different characteristics of stressful events, e.g., controllable versus uncontrollable events. Blix, Cruise, Mitchell, & Blix (1994) used to the P-E fit model in an educational context to analyze the relationship between stress and both motivational style and job rewards among tenure track university professors. However, there are both methodological and theoretical problems with the Resource Fit Model, including the lack of clarity in defining the term fit, the fundamental difference between match in ability and match in needs as theoretical approaches to fit, the lack of a shared zero point in the statistical analyses of person versus environment, the difficulties in constructing questions for

surveys that match person to environment, and the different ideas about the number of fit dimensions to include in a survey (Edwards & Cooper, 1990; Hobfoll, Schwarzer, & Chon, 1998).

Other resource models of stress are the Multiple Resources Models, which emphasize the interaction between resources as the cause of stress. Hobfoll (1989) created the Conservation of Resources (COR) Theory, in which people desire to increase the number of their resources, the actual or threatened loss of resources becomes the principal cause of stress, and people utilize other resources to compensate for lost ones and to prevent further loss of resources. Resources were classified into four categories: object resources (e.g., home, car), conditions (e.g., marriage, seniority, tenure), personal characteristics (e.g., self-esteem, resilience, optimism), and energies (e.g., time, money, knowledge) (Hobfoll, 1989). In a follow-up study, Hobfoll and Lilly (1993) confirmed aspects of COR Theory: in a sample of 255 undergraduates and another sample of 74 community residents, loss was significantly associated with psychological distress, and gain, though important, was secondary to loss, i.e. loss was disproportionately weighted as a human experience and was the chief cause of stress. Holahan & Moos (1986) added social networks into their list of resources when they randomly surveyed 245 men and 248 women in San Francisco to discover that family support operated jointly with self-confidence, an easy going disposition, and the lack of using avoidance coping to protect against the ill effects of stress. Newman and Dale (2005) argued that social networks can add to the individual traits of resilience and adaptability provided that the social network contains both bonding ties (relationships with friends, family, and neighbors) and bridging ties (interactions between networks that provides access to resources and social capital).

In the Social Support Model of Stress, another resource model, social support becomes the primary resource for coping that provides "protective direct action" and "inoculation" against stress (Vaux, 1988, p.137). Drawing on the work of Lazarus, Vaux (1988) argued that social support also guides the primary appraisal (Is the event stressful?), the secondary appraisal (Do I have the resources to cope?), and the re-appraisal process. Pescosolido (1992) extended the scope of the social network and described it as a dynamic and recursive mechanism through which an individual understands and handles difficulties. Hobfoll and colleagues (1998) defined social support as a multidimensional construct that includes perception of social assistance as well as the reality of both social attachments and social assistance. Sarason, Sarason, and Shearin (1986), using three separate experiments over a period of three years, delineated that social support has both personality and environmental characteristics, that social support remained stable over the three year period of study, and that participants who scored high in social support also reported having more parental care than those who scored low. Considerable research has shown that social isolation increases the risk for disease and disease outcome and that having a strong social network can positively influence disease progression and recovery (Hobfoll, Schwarzer, & Chon, 1998). Tashakkori, Brown, & Borghese (2010) advised that all components of an individual's social system be studied concurrently when conducting stress research, including family, school, and community organizations.

Finally, an approach that is more empirical and less theoretically based is the Stressful Life Events approach, which mixes the methods and theories from the previous approaches. The approach uses the Stimulus Response model in that surveys are constructed with lists of both possible stressors and possible disease outcomes derived from previous stress research and uses

the Stress Appraisal Model in that participants are asked to give an impact score that rates the degree to which a stressor causes stress in that person's life (Hobfoll, Schwarzer, & Chon, 1998). Thoits (1994) utilized this method with 532 survey respondents in Indianapolis to conclude that those who were able to solve their problems at work or in marriage had the same incidence of psychological problems as those without problems and had fewer psychological symptoms than those who were not able to find solutions. Repetti (1993) correlated the perceived stress of 52 air traffic controllers with daily mood and health complaints and found that poor interactions with coworkers and supervisors as well as objectively- and subjectively-measured high workload contributed to negative moods.

One new theory that has emerged in the new millennium posits that some work stress can be good. The challenge-hindrance model of stress states that "self-reported work stress associated with some stressors may result in negative outcomes, whereas self-reported work stress associated with other stressors may result in positive outcomes" (Cavanaugh, Boswell, Roehling, & Boudreau, 2000, p. 65), i.e., not all stressors are bad. Positive stressors are named challenges, whereas negative stressors are named hindrances. Cavanaugh and colleagues (2000) surveyed 1,886 managers in the United States and demonstrated that there was a positive correlation between self-reported challenge stress and job satisfaction and a negative correlation between self-reported hindrance stress and job satisfaction. Similarly, LePine, LePine, and Jackson (2004), in a sample of 696 learners, discovered that challenges had a positive relationship to learning performance and hindrances had a negative relationship to learning performance.

Edwards, Franco-Watkins, Cullen, Howell, and Acuff (2014) pointed out that one of the problems with the challenge hindrance model is that environmental stressors become confused with the perceptions of stress, i.e. different people may experience the same external event as either challenging or hindering. They sought to overcome this potential sticky wicket by suggesting that individuals will perceive external events in the same way only when that event is particularly severe or intense.

Another new theory that has gained popularity in the field of occupational stress that has emerged from the resources models of stress: the Job Demands-Resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which states that working conditions can be categorized into two basic categories--1) *job demands*, which can include high work pressure, role overload, emotional demands, and poor environmental conditions, and 2) *job resources*, which can include resources (e.g., salary, job security, opportunities for professional development), interpersonal relations, (e.g., support from colleagues and supervisors), the structure of the organization (e.g., role clarity, participation in decision making), and the nature of the task (e.g., skill variety, task significance, autonomy) (Bakker, Demerouti, & Verbeke, 2004).

The JD-R model states that burnout happens when job demands exceed the available job resources. In looking at a sample of 374 professionals from transport, industry, and human services with the Oldenburg Burnout Inventory, Demerouti and colleagues (2001) discovered that high job demands were primarily linked to the emotional exhaustion component of burnout, while lack of job resources were linked to the disengagement. Bakker, Demerouti, & Verbeke (2004) surveyed 146 employees from 11 companies (53% response rate) and using the JD-R

model concluded that reducing an employee's demands should increase his or her performance and that increasing an employee's resources should increase pro-organization engagement. The implications for principals who are edging towards burnout is clear--find ways to reduce job demands (e.g., sharing leadership and delegating tasks) and increase job resources.

Table 1: Summary of Stress Theories

Stress Theory	Proponents	Summary
Stimulus Response	Elliott & Eisdorfer (1982) Selye (1976)	Stressors are identified that ordinarily cause physical or psychological stress (e.g., death of a loved one, job loss). Borrowing from engineering theories of mechanical stress in which cars can place stress on a bridge and produce strain, this theory posits that events in the environment place stress on the individual and produce strain. The theory has fallen out of favor but never been shown to be invalid.
Homeostatic Model	Holmes & Rahe (1967) McGrath (1970)	Change, whether positive or negative, produces challenge to the individual's homeostasis. The research did not support the theory since negative events caused harm while positive ones were protective against stress. An event must then be unpacked as to whether its positive or negative effects are more influential.
Appraisal Theory	Lazarus (1966) Lazarus & Folkman (1984)	Whatever the individual appraises as taxing or threatening is stressful. This is the most common and the most well accepted stress theory. Coping, the things people do to manage stress, is central to this model. Resources, which are aspects of the self or the social environment, influence coping. There is a slight problem of circularity because appraisal governs both resources and stress.
Challenge-Hindrance	Cavanaugh, Boswell, Roehling, & Boudreau (2000)	Stressors can be appraised positively as challenges or negatively as hindrances. Challenges tend to have positive outcomes whereas hindrances have negative ones. The potential problem is that different people may experience the same event as either a challenge or a hindrance.
Resource Theories:	Allen & Britt (1983) Antonovsky (1979) Dohrenwend & Dohrenwend (1981)	The emphasis of these theories is on the resources possessed by the individual, not on the stressor itself. The poor have a higher incidence of psychopathology precisely because they have fewer resources. The availability of both social and personality resources provides a buffer against stress, and both sets of resources are linked to socio-economic status.
Key Resource	Antonovsky (1979) Kobasa (1979) Ozer & Bandura (1990) Scheier & Carver (1993)	One key resource, which is a personal belief or trait, modulates the effectiveness of other resources. Self-efficacy, optimism, hardiness, and a sense of coherence have all been studied as the possible key resource for protecting against stress. One problem with these models is the strong preference for one resource and the lack of evidence on why that resource is better than others.
Resource Fit	Cutrona & Russell (1990) French, Caplan, & Harrison (1982)	The degree to which the resources fit the stress from the environment determine the amount of stress a person feels. Research has focused on which kind of social support is most beneficial to individuals in different contexts. Many theorists insufficiently define the notion of fit and thus the model is difficult to disprove.
Multiple Resources	Hobfoll (1989) Holahan & Moos (1986)	Stress happens when the individual loses social resources or personality resources (e.g., self-esteem) or when those resources are threatened or do not produce results. Personality resources work together with social

		resources to buffer against stress. One criticism is that the list of potential resources could be endless.
Social Support	Sarason, Sarason, & Shearin (1986) Vaux (1988)	Social support, which includes people who can donate money or goods, assist with problem solving, and provide emotional support, is a multi-dimensional construct that includes social attachments and assistance as well as the perception of these. Social isolation correlates with higher risk for illness while close relationships protect against illness.
Job Demands-Resources	Demerouti, Bakker, Nachreiner, & Schaufeli (2001)	Stressors are collectively labeled as job demands and the resources which help to buffer against these demands are labeled job resources. Burnout occurs when job demands exceed job resources. The reduction of demands for employees may increase performance and the increase of resources may increase engagement.
Stressful Life Events	Schwarzer & Hahn (1995) Thoits (1995)	A mixed approach combining aspects of the Stimulus Response Model and the Appraisal Theory, this model utilizes checklists of negative events and user ratings of the impact of those events.

Derived from Hobfoll, Schwarzer, and Chon (1998), with Demerouti, Bakker, Nachreiner, & Schaufeli (2001) and Cavanaugh, Boswell, Roehling, & Boudreau (2000).

Stress has many approaches to its study. One problem with its study may be that the term means different things to different people: anxiety, worry, conflict, or even frustration (Onwuegbuzie, Jiao, & Collins, 2007). Indeed, Cooper and Dewe (2004) argued that the methodological pluralism in the investigation of stress may shed light on the link between the individual and the environment and that there is moral imperative to study stress because of its link to the disease process: the more we understand stress and coping, the more we can develop processes and organizational structures to support healthier individuals. Sogunro (2012) gave a list of the possible effects of chronic stress:

> Unabated high stress levels have been known to predispose stressées (i.e., stress victims) to serious psychological, physiological, physical, and socioemotional problems, including nerve disorders, depression, cardiovascular diseases (e.g., high blood pressure, and stroke), fatigue, migraine headaches, backaches, muscle pains, physical wear and tear, weight gain or loss, ulcers, upset stomach, insomnia or sleep deprivation, sleep apnea, frustration, outbursts of anger and panic attacks, unremitting tension and anxiety, high

rates of alcoholism, confusion, helplessness, and lingering feelings of inadequacy. In extreme cases, on-the-job stress can lead to burnout, suicide, or untimely death. (p. 665)

Indeed, Seaward (2014) reported that all the leading causes of death (e.g., heart disease, cancer, accidents) have been linked to stress and that some medical experts believe that as much as 70% - 85% of all illnesses are linked to stress. Because of the serious consequences of unaddressed high levels of stress, the study of stress and of the prevention of its consequences is indeed worth our while.

Principals and Stress

Role conflict, the difficulty complying with two or more opposing sets of pressures, and role ambiguity, the lack of information required to perform a task, came to dominate the early research on stress in the workplace in the 1950s and 1960s (Cooper & Dewe, 2004). Gmelch & Torrelli (1993) examined these constructs in relation to the stress experienced by administrators and found a substantial relationship between role conflict and ambiguity and only one aspect of their stress, that of resolving disputes. The stress experienced by principals seems to have more dimensions than most workplace stress experienced in other professions.

In their seminal study on principals and stress, Gmelch and Swent (1977) examined the stress levels of 1156 principals, vice-principals, superintendents, and other office administrators in Oregon Public Schools using a survey instrument that they developed called the Administrator Stress Index, consisting of five sets of seven questions, each set relating to one of the five categories of administrative stress: 1) *administrative constraints*, e.g., fielding interruptions, attending meetings, writing memos, complying with regulations, filling out paperwork; 2) *administrative responsibility*, e.g., supervising employees, speaking in public, evaluating staff,

seeking money; 3) *interpersonal relations*, e.g., mediating conflicts with students, managing student discipline, mollifying conflicts with parents, resolving conflicts among employees; 4) *intrapersonal conflicts*, e.g., feeling unqualified, requiring more information for decisions, having insufficient authority, making too little progress; and 5) *role expectations*, e.g., desiring to satisfy the expectations of the superior, being unclear about the scope of the responsibilities, attending events outside of the normal school hours. The results of their study, i.e., the top 10 stressors for Oregon Administrators, are reported in the table below:

Table 2: Top 10 Stressors for Principals

Rank	Stressor
1	Complying with state, federal, and organizational rules and policies
2	Feeling that meetings take up too much time
3	Trying to complete reports and other paperwork on time
4	Trying to gain public approval and/or financial support for school programs
5	Trying to resolve parent school conflicts
6	Evaluating staff members' performance
7	Having to make decisions that affect the lives of people whom I know
8	Feeling that I have too heavy a workload, one that I cannot possibly finish during the normal work day
9	Imposing excessively high expectations on myself
10	Being interrupted frequently by telephone calls

Gmelch & Swent (1977)

They also found that 60% of administrators attributed between 70% and 100% of their total life stress to their job.

Gmelch and Swent subsequently used factor analysis on their data to identify four sources of stress for administrators: 1) *role-based stress* (RB), originating from the administrators' beliefs and attitudes about their job responsibilities at the school; 2) *task-based stress* (TB), originating from daily duties, including meetings, memos, interruptions, deadlines,

phone calls, and after-school activities; 3) *boundary-spanning stress* (BS), originating from external interactions such as negotiations and fundraising; and 4) *conflict-mediating stress* (CM), originating from resolving any dispute at the school, including student discipline, conflicts within the student body, and conflicts between parents and the school (Koch, Tung, Gmelch, & Swent, 1982).

The conceptual framework utilized by these researchers was aptly named the Administrator Stress Cycle (Gmelch & Swent, 1984; Gmelch & Torelli, 1993), which leaned heavily on the Appraisal Theory of Stress (Lazarus, 1966; Lazarus & Folkman, 1984; McGrath, 1970). The Administrator Stress Cycle consists of four stages: 1) *Stressors* from one of the four sources of stress mentioned in the previous paragraph, namely role-based, task-based, boundary-spanning, or conflict mediating stress; 2) *Perception*, in which the administrator appraises the event as stressful or not; 3) *Response*, a physiological, psychological, or behavior change as a result of the stressor--coping strategies can be used in this stage to attempt to deal with the stress positively; and 4) *Consequences*, which include long-term effects of stress, such as physical or psychological illness or burnout (Gmelch & Swent, 1984; Gmelch & Torelli, 1993).

Burnout, one of the consequences of stress, was codified by Maslach and Jackson (1981), who created an instrument that has been used frequently in the assessment of principals. Burnout has three distinct categories. Characterized by loss of energy and general fatigue, *emotional exhaustion* happens when principals feel that their emotional resources have been depleted (Maslach & Jackson, 1981; Shumate, 1999). Characterized by negative and cynical feelings towards one's co-workers and subordinates, *depersonalization* leads principals to dehumanize

their staff and view them as undeserving of their troubles (Maslach & Jackson, 1981). Finally, when principals begin to evaluate themselves negatively, feel unhappy about themselves, and become dissatisfied with their accomplishments, they suffer from a diminished sense of *personal accomplishment*. The Maslach Burnout Inventory (Maslach & Jackson, 1981) was developed to measure burnout and was used frequently in studies on administrator and teacher stress. Andreyko (2010) added that burnout is not the result of the occasional setback or discouragement; rather, it is a multi-dimensional phenomenon that manifests itself in the physical, intellectual, social, emotional, and spiritual dimensions of the human experience.

Older research that used instruments other than the ASI arrived at some noteworthy conclusions. Cusack (1982) obtained data from 350 elementary and 267 secondary school principals in Virginia. Younger principals experienced more stress in the area of interpersonal relationships, demographics of the schools affected principals' stress levels, and secondary school principals experienced more stress than elementary school principals. Saffer (1984) analyzed 44 dissertations on principals and stress from 1969 to 1982 and concluded that despite the recurring weaknesses of using convenience samples and inappropriate instruments, higher levels of stress predicted health problems, more hours of work predicted higher level of stress, and higher levels of stress predicted lower levels of organizational innovativeness (Saffer as reported in Shumate, 1999).

Kresyman (2010) argued for a trend in the source of principal stress: the primary source in principal stress before the No Child Left Behind Act was task-based stress, while after the legislation, boundary spanning stress became the top stressor for principals in the new millennium. Although research has pointed to additional stressors that appeared after this

legislation, this review has found that task-based stress has been the predominant stressor for principals for the past 30 years.

The Administrator Stress Index (ASI) (Gmelch & Swent, 1977) has been used in numerous studies for principals in the 1980s. Brimm (1981) used the ASI with over 600 administrators in Tennessee and found that the top stressor was compliance with federal, state, and organizational rules and policies (BS) (Brimm as reported in Shumate, 1999). Olsen (1984) used the ASI to investigate the correlation between stress and burnout among 346 California elementary, junior high, and high school principals and surprisingly found that role-based stress was the highest source of stress for principals because it accounted for 50% of the common variance and that these principals were experiencing low to moderate levels of burnout. Nelson (1985) examined the survey results from 159 elementary school principals (52% response rate) in New Hampshire and discovered that 36% of the sample felt tension, 25% anxiety, and 20% unusual fatigue, with task-based stress being the most frequent and intense source of stress. The two most intense sources of stress for these principals were evaluating staff (TB) and completing paperwork (TB).

In the latter part of the 1980s, Williamson & Campbell (1987), examining the results of 243 high school principals in Texas (61% response rate) who took the ASI, concluded that time-management (TB) caused the largest amount of stress, with relationships with superiors (RB/CM) and subordinates (TB/CM) and the management of finances (BS) being subsequent stressors. They also found that principals of larger high schools had more time management stress than those at smaller high schools, that principals at smaller schools had more stress from relations with subordinates than those at the largest schools who had assistant principals as

buffers, and that older principals (50-59) had more stress from relationships with superiors, probably because those superiors were younger and consequently more innovative. Cooper (1988), using the ASI nationally with 175 principals (82% response rate) whose schools received recognitions of excellence from the National Secondary School Recognition Program, found that 8 of the top 10 stressors for these high school principals were task-based stressors.

The 1990s also produced many studies using the ASI that pointed to task-based stress as the predominant stressor for principals. Czerniakowski (1995), examining the responses of 91 principals of K-6 schools in Pennsylvania (61% response rate), found that heavy workload (TB), meetings (TB), and complying with rules and policies (BS) were the top three stressors in that order. Additionally, stress from administrative constraints predicted administrator depersonalization, stress from role expectations predicted total burnout, administrators in aggregate reported experiencing moderate levels of stress, and older principals experienced less burnout than the younger ones. Examining the survey results from 236 high school principals of large schools with 1600 to 2400 students in California (73% response rate), Atwood (1996) discovered the somewhat counter-intuitive results that the stress from finding financial support for school programs (BS) and dealing with staff (TB) were the highest sources of stress and that these principals did not find their positions highly stressful. Allison (1997), gathering data with the ASI from 643 elementary and secondary school principals (44% response rate) in British Columbia, noticed that principals with higher stress scores had fewer coping techniques to draw from and less often used what techniques they had. Kilgore (1999) compared ASI results to demographic data from 295 principals in Mississippi (60% response rate) and discovered that female principals had higher boundary spanning stress than male principals, that role-based

stress was the greatest source of stress for all groups, and that experience, setting of the school, and gender affected how stress was experienced. Shumate (1999) connected the ASI to burnout in 221 principals in Washington State (81% response rate) and unearthed that 73% of principals experienced burnout in emotional exhaustion and that the highest stress factors were after-school activities, workload, and meetings--all task-based stress. Most interesting was the result that all sections of the ASI correlated with burnout in emotional exhaustion and depersonalization, i.e., more stress predicted more burnout.

The ASI was also popular in the first five years of the new millennium, with task-based stress again being the most common stressor. Ryan (2001) looked at 171 high school principals in Massachusetts (60% response rate) who rated compliance with rules and procedures (BS), workload (TB), paperwork (TB), meetings (TB), and high expectations for self (TB) as their highest sources of stress in that order. Interestingly, they also arrived at a Pearson correlation of .51 between task-based stress and boundary-spanning stress and no significant correlation between the size of school and the stress of the principal. Weber-Sorice (2002) obtained data from 116 principals in central Florida (55% response rate), finding that task-based stressors occupied three of the top four spots: workload (TB), paperwork (TB), financial support for school programs (BS), and meetings (TB). Investigating the stress of 221 elementary school principals in South Dakota (87% response rate), Halling (2003) identified that the small number of principals who had dual roles as either superintendents or teachers experienced more stress than those who were principals only and that the top stressors for principals were complying with rules and procedures (BS), high expectations for self (TB), workload (TB), paperwork (TB), and after-school activities (TB) in that order, i.e., four of the five stressors are again task-based.

Bradley (2003) attempted to find a connection between demographic variables and the four sources of administrator stress amongst 130 principals in Mississippi (71% return rate); however, there was no connection with years of experience and size of school to stress levels among these participants. The only connection she found was that male principals (46% of the sample) reported more stress than female principals (54% of the sample); task-based stress was also the number one stressor, except among those with the fewest years of experience, who were stressed most by role-based stress.

The next four years of research showed similar findings, i.e., task-based stress was the most impactful stressor, but new stressors began to be identified. Adding another seven questions to the ASI concerning school reform based stress (ReB), Welmers (2005) employed a survey with a stratified random sample of 300 elementary, middle, and high school principals in North Carolina (65% response rate). Workload (TB), paperwork (TB), and meetings (TB) were the top three, with competition with and comparison to other schools (ReB), compliance with rules and policies (BS), and responsibility for test scores (ReB) being the subsequent stressors. The new category of reform based stress identified new stressors for principals, and Welmers found that gender, age, and experience were not related to administrator stress. Adding two open-ended questions, Redfox (2005) surveyed 192 K-5 or K-6 elementary school principals in southern California (71% response rate) and discovered that task-based stress was the most bothersome and that there was no relationship between stress and gender or experience. The open-ended questions identified additional sources of stress: special education issues, funding and budget cuts, accountability measures, parental conflict issues, and staff conflict issues. Clash (2006) surveyed 190 elementary school principals in one region of Virginia (80% return

rate) with a modified ASI of 40 questions and reported that task-based stress was the highest stressor. However, new stressors of working with special needs students (TB), working within legal guidelines (BS), and measuring student performance with standardized tests (ReB) were also high sources of stress. Female principals experienced significantly more task based stress than male principals. Employing a mixed-methods approach with nine follow-up interviews, Monroe (2007) surveyed 55 high school principals in Arizona (55% response rate). Compliance with regulations (BS), workload (TB), meetings (TB), after school activities (TB), and paperwork (TB) were the highest sources of stress on the ASI, and experience was not a factor in the amount or source of stress. Qualitative data uncovered that the requirements of standardized testing, report cards, compliance with special education law, and other externally mandated procedures were sources of stress. Buss (2008) used the ASI with 109 female middle school principals (72% response rate) in southern California and found that high self-expectations (TB), workload (TB), meetings (TB), and paperwork (TB) were the top four stressors, with the boundary-spanning stressor of decisions that affect the lives of others being the fifth stressor.

The last five years has confirmed the research at the start of the new millennium: new stressors have appeared concerning school reform and task-based stress is still the most predominant stressor. Kresyman (2010) used the ASI with open ended questions with 256 principals in Nevada (45% return rate) and found that feeling responsible for inadequate yearly progress (ReB) was the top stressor and being publicly compared to other schools (ReB) was the third top stressor, with the other stressors in the top five being paperwork (TB), high self-expectations (TB), and complying with rules and policies (BS). Carson (2010) demonstrated that the stressors of workload (TB), meetings (TB), reports (TB), and daily interruptions (TB)

were the top stressors among 222 elementary school principals in North Carolina (44% response rate), with stress showing no correlation to age, experience, level of education, or school location. Wilson (2010) used qualitative interviews with 12 novice principals to ascertain which of the four sources of stress were worse for this sample. Surprisingly, novice principals reported the most stress from and the least preparation for conflict-mediating.

Poe (2011), examining the data from 34 elementary school principals in east Tennessee (69% response rate), used Spearman Rank correlation statistical analysis and found that task-based stress was the highest and that stress types correlated with leadership styles. Leadership styles were assessed using the Multifactor Leadership Questionnaire developed by Avolio and Bass (1995). Transformational leadership correlated with conflict-mediating stress (r=.44), and transactional leadership correlated with both task-based stress (r=.41) and boundary-spanning stress (r=.36). Romney (2012) polled 605 Texas secondary school principals (21% response rate) to discover that task based stressors were the top five and that gender, age, and socio-economic level of the campus did not correlate to stress; however, there were differences in stress vis-a-vis race and experience: Latino/Hispanic principals had less stress than white or African American principals and principals with 11-15 years experience had less stress than those with less experience.

The following table summarizes the research reported above. Researchers and the year their studies were performed are identified in the first column, participants in the second, the top three stressors in the third, and the stressors ranked four through six are identified in the last column if the researcher mentions them. Task-based (TB) stressors are identified 46 times, boundary-spanning (BS) stressors 12 times, role-based (RB) stressors five times,

conflict-mediating (CM) stressors four times, and reform-based (ReB) stressors five times. If the researcher simply reported that a particular stress category was the top stressor without reporting the specifics, then that category alone is placed in the table.

Table 3: Summary of Highest Stressors in Principals according to the ASI

Study	Participants	Top Three Stressors	Subsequent Stressors
Brimm (1981)	600 administrators in TN	Compliance (BS)	
Olsen (1984)	346 elementary, junior high, & high school principals in CA	(RB)	
Nelson (1985)	159 elementary school principals in NH	Evaluating Staff (TB) Paperwork (TB)	
Williamson & Campbell (1987)	243 high school principals in TX	Time management (TB) Relations with superiors (RB/CM) Relations with subordinates (TB/CM)	Management of finances (BS)
Cooper (1988)	175 high school principals of schools with recognition of excellence in the USA	8 of top 10 (TB)	8 of top 10 (TB)
Czerniakowski (1995)	91 K-6 principals in PA	Workload (TB) Meetings (TB) Compliance (BS)	
Atwood (1996)	236 high school principals of large schools	Funding Programs (BS) Dealing with Staff (TB/CM)	
Allison (1997)	643 elementary and secondary school principals in British Columbia	Unreported	
Kilgore (1999)	295 K-12 principals in MS	(RB)	
Shumate (1999)	221 principals in WA	After-school Activities (TB) Workload (TB) Meetings (TB)	
Ryan (2001)	171 high school principals in MA	Compliance (BS) Workload (TB) Paperwork (TB)	Meetings (TB) High Self-Expectations (TB)
Weber-Sorice (2002)	116 principals in FL	Workload (TB) Paperwork (TB) Funding Programs (BS)	Meetings (TB)
Halling (2003)	221 elementary school prinicipals in SD	Compliance (BS) High Self-Expectations (RB) Workload (TB)	Paperwork (TB) After-school Activities (TB)
Bradley (2003)	130 principals in MS	(TB) highest stressor (RB) highest stressor for new principals	
Welmers (2005)	300 K-12 principals in NC	Workload (TB) Paperwork (TB) Meetings (TB)	Comparison to Other Schools (ReB) Compliance (BS) Responsibility for Test Scores (ReB)

Redfox (2005)	192 K-6 principals in southern CA	(TB)	
Clash (2006)	190 elementary principals in VA	(TB)	Special Needs Students (TB) Legal Guidelines (BS) Standardized Tests (ReB)
Monroe (2007)	55 high school principles in AZ	Compliance (BS) Workload (TB) Meetings (TB)	After-school Activities (TB) Paperwork (TB)
Buss (2008)	109 female middle school principals in southern CA	High Self-Expectations (TB) Workload (TB) Meetings (TB)	Paperwork (TB) Decisions affecting others (BS)
Kresyman (2010)	256 principles in NV	Inadequate Progress (ReB) Paperwork (TB) Comparison to Other Schools (ReB)	High Self-Expectations (TB) Compliance (BS)
Carson (2010)	222 elementary school principals in NC	Workload (TB) Meetings (TB) Reports (TB)	Daily Interruptions (TB)
Wilson (2010)	12 novice principals	(CM)	
Poe (2011)	34 elementary school principles in TN	(TB)	
Romney (2012)	605 high school principals in TX	(TB)	(TB)

Allison (1997); Atwood (1996); Bradley (2003); Brimm (1981); Buss (2008); Carson (2010); Clash (2006); Cooper (1988); Czemiakowski (1995); Halling (2003); Kilgore (1999); Kresyman (2010); Monroe (2007); Nelson (1985); Olsen (1984); Poe (2011); Redfox (2005); Romney (2012); Ryan (2001); Shumate (1999); Weber-Sorice (2002); Welmers (2005); Williamson & Campbell (1987); Wilson (2010).

Researchers have also utlized the Job Demands-Resource (JD-R) model of burnout to examine stress in principals. Combs, Jackson, and Edmonson (2007) confirmed the utility of the JD-R by predicting burnout among elementary school principals and also discovered that principals who reported higher levels perceived trust with and relationship quality to parents, students, teachers, and supervisors also reported less burnout. Combs and Edmonson (2010) surveyed 190 high school principals in Texas (42% response rate) using the Maslach Burnout Inventory-Educators Survey (MBI-ES) and their own instrument called the High School Principal Work Conditions Questionnaire and determined that principals had equally high job demands except in the area of curricula, with principals who experienced low emotional exhaustion being four times more likely to note curriculum as a time consuming activity than

principals who responded with high emotional exhaustion. The researchers also unearthed that 30% of their sample were experiencing high burnout from emotional exhaustion.

In comparison to the vast amount of research on public school principal stress, very little research has been done on Catholic School principals' stress. In fact, a search of the terms "Catholic" and "Administrator Stress Index" yielded no relevant results in ERIC, Google Scholar, or Proquest. Catholic school principals may be experiencing stress similar to those of their public school counterparts, but some structural differences in how the schools are organized may also affect how the stress is experienced by the principal. Relationship to the bishop or archbishop, relationship to the pastor (if the school is parochial), desire to fulfil the mission of the school, attempts to increase enrollments, questioning the role and purpose of the Catholic school, the conflict between wanting diversity mandated by Church social justice teachings and the desire for wealthy families, and the struggle to maintain a Catholic ethos among a non-Catholic student and faculty population may be additional stressors that the Catholic school principal experiences that the public school principal does not (McLaughlin, O'Keefe, & O'Keeffe, 1996). Similarly, non-Catholic principals at Catholic schools (or even Catholic prinicipals) may experience faith-based stress if their personal beliefs conflict with the doctrine and principles that they are supposed to uphold as the face of the Catholic Church for their school.

However, the extant research shows that Catholic school principals are experiencing stress similar to that of their public school peers. Costello (1981) compared a sample of 75 female religious principals (82% response rate) to a sample of 154 women religious teachers (84% response rate) using a burnout instrument. Roman Catholic sisters who were

administrators experienced more physical, emotional, and psychological exhaustion, had higher rates of absenteeism, and had fewer feelings of job satisfaction than the Roman Catholic sisters who were teachers. Female religious administrators also experienced more extreme stress than did the teachers, but the instrument used to evaluate this conclusion was a single question. Hand (2010) used the Occupational Stress Inventory Revised to examine the stress and leadership of Catholic school principals in Queensland, Australia. Although principals reported the highest level of strain, this result was not significant ($p=.07$).

Veto, Nugent, and Kruse (2001) reported that Catholic scholars suggested that shared norms and values as well as a strong professional community support the Catholic school principal, but the strong community does not mitigate the principal's stress. Although they did administer the ASI to 141 Catholic school principals to find their sample of six low-stressed principals for their qualitative study, they did not report the results of that survey. However, they did produce five implications: 1) Even when stressed, Catholic school principals ought to respond to others with care and concern, 2) Principals used collaborative teaming as a stress response, 3) Principals used professional management and organizational skills to deal with difficult situations, 4) Principals used personal faith as a stress-reliever, and 5) Principals learn from small successes and develop a "bag of tricks" to deal with stressful situations.

Fraser and Brock (2006) had 20 Catholic elementary school principals in New South Wales, Australia complete narratives about their job experiences and followed up with phone interviews with 17 of these. Twenty-seven randomly selected high school principals were sent invitations to participate in the study, and none agreed to participate. The principals at Catholic elementary schools identified the following drawbacks to their job: isolation, stress, insufficient

remuneration, staff issues, unchurched and demanding parents, interfering pastor, lack of support and trust from the employing authority, lack of recognition, insufficient clarity of roles and responsibilities, growth of responsibilities within principal's role, and the non-educational aspects of many new responsibilities. Although many of these stressors appear on the ASI, some are indeed specific to the Catholic context.

In summary, Gmelch & Swent (1977) advanced the research on stress and administrators, and their instrument has been used, even in a slightly modified form, consistently in dissertations and other research consistently since its inception. A consistent recurring theme is that task-based stress is the most predominant stressor for most administrators in most settings. Although a new stress group has appeared involving school reform, that stress group can be seen to fit into task-based stress because much of the stress in that group of questions comes from having to comply with state and federal regulations. Gender, experience, race, size of school, and age may play a role in the amount of stress experienced, though no consensus was reached in the review. Very little research has been done on the stress experienced by Catholic school administrators, but it appears that these administrators are prone to the similar levels of stress as the public school peers.

Principals and Coping

Research on coping began with the seminal work by Lazarus (1966), who expanded the previous notions of coping from ego-psychology and psychological defense to notions of cognitive and behavioral responses to manage stress (Folkman & Moskowitz, 2004). Searching the PsychLit database from 1967 to 1998, Somerfield and McCrae (2000) found 13,744 articles

on “coping behavior.” The field is truly enormous, so the review here will be limited to those seminal works that deal specifically with coping and principals.

Lazarus & Folkman defined coping as “the constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). In other words, after the person has made an appraisal that a situation is stressful, that person makes conscious or unconscious mental actions or behavioral changes in order to better navigate the situation that is perceived as stressful. Also important to note is that this definition of coping is cyclical and multi-faceted: a person changes the coping techniques used in response to the re-appraisals of stress and the person draws from multiple coping techniques (Lazarus & Folkman, 1984).

Folkman and Moskowitz (2004) consolidated research that suggested that coping exists within an emotional environment that results from the appraisal of stress: a stressor can elicit strong negative emotions that may induce additional stress and mollifying these emotions can be an instrumental aspect to the coping process. They also emphasized that successful resolutions to stressful situations can generate positive emotions, whereas unclear or unsuccessful resolutions can generate negative emotions. Emotions can happen as an outcome of coping, from a response to new information, or from the reappraisal process.

Gmelch and Swent (1977) performed a seminal study of administrator coping techniques, in which they examined the coping preferences of 1,156 Oregon administrators. Although they noticed that the coping techniques were very individualistic, they were able to categorize the techniques into three groups: 1) physiological activity, 2) cognitive control, and 3) acquisition of interpersonal and management skills. Gmelch & Swent (1977) further subdivided physiological

activity into three more categories: a) physical work or exercise, e.g., jogging, gardening, or sex; b) separation from the work environment, e.g., retreating to the mountains or engaging in friendships outside of the school environment, and c) relaxation techniques, e.g., yoga, meditation, or hobbies. They found the widest range of responses in the area of cognitive control, which they defined as "positive attitudes and supportive philosophies of life" (p. 28), including sharing problems, prayer, religion, sense of humor, emotional control, and setting realistic goals. The acquisition of interpersonal and management skills consists of developing skills to improve job performance effectiveness in the areas of time management, conflict resolution, team management, delegation, etc. Of their sample, approximately 50% used coping with physiological activity, 40% coping with cognitive control, and 10% coping with the acquisition of interpersonal and management skills. Although the authors believed that coping with the acquisition of interpersonal and management skills could be effective, they theorized that few administrators used those coping skills because they did not feel they were effective or because they had not sufficiently mastered those skills.

Roesch (1979) looked at the survey responses of 290 elementary school principals in Virginia (73% response rate). She discovered that there was no significant relationship between either anxiety score, administrative experience, gender, age, or school size and coping preference. Perhaps her biggest contribution to the field was his development of a Coping Preference Scale. She culled 55 items into 23 items in seven categories using factor analysis. The seven categories were 1) Recreations/Passive Activities, 2) Consultative Techniques, 3) Exercise Activities, 4) Workaholic Activities, 5) Proactive Techniques, 6) Time-out Activities, and 7) Eat/Sleep Techniques. Refer to Table 4 below for the results of her factor analysis.

Table 4: Coping Preference Scale

Recreation/Passive Activities	Continue in the same way and hope for the best
	Plan a vacation
	Organize a party
	Think about the future
	Think happy thoughts of past events
	Purchase new items
	Call a friend
	Listen to music
	Do volunteer work
Consultative Techniques	Consult superior
	Delegate task assignments
	Discuss concerns with principal in different school
	Discuss concerns with colleagues in education
Exercise Activities	Exercise
	Jog/run
Workaholic Activities	Take work home
	Work on weekends
Proactive Techniques	Curse
	Take a drink
Time-out Activities	Temporarily change to a different task
	Take a short break
Eat/Sleep Techniques	Change sleeping habits
	Change food intake

Roesch (1979)

Roesch's (1979) Coping Preference was a great first step in the categorizing the ways in which principal's coped.

Bailey, Fillos, and Bailey (1987) examined the coping of 22 principals (92% response rate) who were identified by their superintendents as exemplary. Not only did these principals exhibit fewer symptoms of stress as manifested by low absentee rates and good physical and psychological health, but they also preferred recreational, avocational, and management skills approaches to coping. They valued goal-setting, planning, and outcomes, and they were less likely to use diet, exercise, support groups, or family to help cope with stress.

Gmelch (1988) reassessed his data from studying 1800 administrators in Oregon to produce a more refined instrument called the Coping Response Inventory (as cited in Gmelch & Chan, 1994). Possessing seven factors as well, the instrument has categories that make intuitive sense and have anywhere from 12 to 33 options in each category. A brief summary of the instrument is reproduced here:

Table 5: Coping Response Inventory

Coping Categories	Examples
Social	Talk with friend/spouse, play with kids, give presents, visit relatives, participate in community activities, confront people directly
Physical Activity	Shoot baskets, play team sports, relax with meditation or yoga, take a brisk walk, other exercise, have sex, stroll through park/shops, coach sports
Intellectual Stimulation	Study religion, philosophy, art, or classics; attend professional conferences; take short courses or workshops; travel for personal enrichment
Entertainment	Watch television, go to a movie, take a longer vacation, have a quiet lunch alone, attend a concert, watch people, read a book, watch a sporting event
Personal Interests	Play a musical instrument, work around the house, gardening, have a drink, cook gourmet meals, creative writing, train dogs or other animals, gamble
Managerial	Share problems with colleagues, delegate, say no, reduce meeting times, set professional goals, take time to plan, communicate clearly, take short breaks
Attitudes	Take time to think, smile, cry, sing by yourself, laugh at self, be optimistic, accept what can't be changed, do the best you can, keep a sense of humor

Gmelch & Chan (1994)

Gmelch and Chan (1994) recommended that principals use the Coping Response Inventory to assess if there is a category that is not currently being used for coping and to add any under-utilized categories or items to that principal's coping repertoire.

Cooper (1998) examined the survey responses of 175 principals from across the United States whose schools had received recognition from the National Secondary School Recognition Program and used the Roesch (1979) Coping Preference Scale to discover that the most popular coping strategies of these principals were 1) discussing concerns with colleagues in education, 2)

delegating tasks or assignments to others, and 3) taking work home. Cooper's suggestions for principals included 1) reducing task-based stress with time management, planning, and goal-setting, 2) attending monthly meetings with fellow principals as well as state and national conventions to establish a network of colleagues, 3) delegating tasks to others, and 4) finding the time to exercise.

Gmelch and Chan (1992) analyzed the survey data of 740 Washington State principals and superintendents (74% response rate) who took the ASI, the Maslach Burnout Inventory, a demographic survey with the Bem Sex Role Inventory, and coping effectiveness questions. They discovered an inverse relationship between perceived stress and perceived coping effectiveness ($r = -.57$). For example, principals who reported more stress from task-based stress also reported that they were less effective at task-based coping. They also discovered that principals who experienced emotional exhaustion burnout and depersonalization burnout coped less effectively with respect to all sources of stress, with the highest correlation existing between emotional exhaustion and task-based ($r = -.44$) and role-based ($r = -.35$) stress coping. Perceived coping effectiveness in role-based, conflict-mediating, and boundary-spanning stress correlated positively to a sense of personal accomplishment. The researchers also suggested that training administrators to have greater behavioral adaptability with respect to having access to traits associated with both males and females promises to increase coping effectiveness.

Allison (1997) examined the survey responses of 643 principals in British Columbia (44% response rate) with the ASI, a demographic questionnaire, Roesch's Coping Preference Scale, and a space to write in other coping techniques. Reclassifying some of the results of the

Coping Response Inventory, Allison ended up with seven categories of coping, and the results of Allison's research can be found below in Table 6.

Table 6: Coping Factors

Coping Category	Examples
Good Physical Health Program	Physical exercise, good health habits, good sleep habits, non-work activities
Withdrawal and Recharging	Relaxation, withdraw physically from a situation, change to a less stressful task, take mini-vacations, socializing
Intellectual, Social, & Spiritual Support	Engage in activities that support spiritual growth, talk to family members or close friends, engage is less active non-work or play activities
Positive Attitude	Practice good human relations with people at work, approach problems optimistically, create positive mental sets, use inservices to increase skills
Realistic Perspective	Set realistic goals, delegate responsibility, maintain a sense of humor
Time Management and Organization	Prioritize and use time management techniques, establish procedures so that visitors are screened and interruptions are kept to a minimum
Increased Involvement	Work harder, community involvement

Allison (1997)

Although Allison collected many positive responses on the open response section that matched the items in the above categories, many responses included destructive coping techniques such as snacking or self-medicating with drugs or alcohol. Principals with higher stress scores on the ASI tended to cope with more work related coping techniques, whereas principals with lower scores on the ASI tended to cope more with personal health and well-being techniques. Furthermore, principals with higher stress scores had a more limited repertoire of coping techniques and used these techniques less frequently, and younger principals (30-39) coped more by working harder than older principals. Finally, Allison demonstrated that a principal's level of education influenced his or her frequency of coping, with principals with doctorates reporting the greatest use of coping strategies, followed by those with master's degrees.

Shumate (1999) examined the responses of 221 Washington State high school principals (81% response rate) who completed the ASI, the Maslach Burnout Inventory, and the Roesch Coping Preference Scale. Workaholic activities, e.g., taking work home and working on weekends, was the preferred method for dealing with stress at work. For dealing with meetings, workload, or compliance, principals were slightly more likely to curse, take a drink, or change their eating and sleeping habits. Principals indicated that more exercise time did not help stress because of the limited time available to them. To cope with parent conflicts, student conflicts, and staff conflicts, principals preferred to consult with their colleagues, delegate, or change their eating and sleeping habits. Principals took work home to cope with conflicts between performance and self-expectations, and to cope with conflicts between self-expectations and public expectation, principals preferred to curse, take or drink, or change their eating and sleeping habits. Changing eating and sleeping habits was the preferred coping for dealing with supervision, evaluation, negotiations, and gaining public support.

Weber-Sorice (2002) looked at 116 survey responses of public school principals in Florida (55% response rate) who completed the ASI and the Preventive Resources Inventory and found that the preventive coping techniques that principals employed were not significantly related to gender, years of experience, hours worked per week, school level, or school enrollment. Also, principals who scored higher on the Preventive Resources Inventory had significantly lower scores on the ASI, i.e., the utilization of more coping resources predicted lower stress.

However, Folkman & Moskowitz (2004) catalogued a list of the potential problems of using a coping checklist for empirical research: 1) the length of the instrument could be

burdensome, 2) the response keys could be difficult to interpret, 3) there are variations in recall periods, 4) the meaning of a coping strategy might differ for different people, 5) recall could be unreliable, 6) items could be confounded with outcomes, and 7) the accuracy of recall about specific thoughts or behaviors might be muddled over time. As a response to the checklist method, they reported that some researchers attempted to utilize momentary coping data collection whose benefits included usefulness in intra-individual designs and elucidation of the relationship between coping and mood and between coping and illness and whose drawbacks included the under-reporting of coping and lack of big picture retrospectives. Ultimately, they settled on a narrative approach to collecting data on coping because of its ability to uncover ways of coping that may not be covered in inventories, the possibility of its being a better predictor of future outcomes, and its elucidation of the complexity of the stressor that a person is coping with. Suggesting that the study of coping is as much an art as a science, they also concluded that narrative and quantitative approaches to coping produce overlapping, but not necessarily equivalent, data. Similarly, Somerfield and McCrae (2000) critiqued previous studies because of the poor methodology of much of the coping research, the lack of attention to unconscious reactions to stress, the narrow selection of coping choices, and lack of research between coping and clinical practice; so they advocated for a "within-person, process oriented approach" (p. 621) to the study of stress and coping. Lazarus (2006) also criticized the systems approach to stress and supported a narrative approach to the study of stress and coping.

Another critique of the coping research is that the research has focused on the quantity of coping but not on the quality of the coping. Hobfoll, Schwarzer, and Chon (1998) used the telling analogy:

> We have examined that carpenters use tools, but not the excellence of their work. A piece of fine furniture does not emerge from just any attempt at sawing and fastening, but we have imagined that good coping outcomes emerge from any manner of problem solving. (p. 204)

Similarly Cooper and Dewe (2004) emphasized that the commitment to a coping technique and the willingness to adopt fundamental lifestyle changes in implementing certain coping techniques is the key to unlocking their potential. They also declared that the aim of coping is to develop "an inner sense of energy for dealing with stress-related encounters" (Cooper & Dewe, 2004, p.102). One aspect of the design of the current study is that the quality of the pranayama practice will be examined for quality in terms of frequency of practice, breath ratio, and observer notes on the practice, and participants will have an opportunity to produce a narrative of their experience in the interviews.

There are two other ways to classify coping techniques, and although these approaches have not been used in research that analyzes principals and stress, they ought to be mentioned simply because of the substantial body of research that exists using these paradigms. Lazarus and Folkman (1984) developed two distinct categories of coping: 1) *problem-focused coping*, which attempts to address external aspects of the stressor by attempting to change the stressor itself and 2) *emotion focused coping*, which attempts to address internal aspects of the stressor by ameliorating the emotional reactions to the stressor. Suls and Fletcher (1985) classified coping into two categories as well: 1) *attention strategies*, which confront aspects of the stressor, and 2) *avoidance strategies*, which steer clear of the stressor. Nes and Segerstrom (2006) developed a

table to show how these two systems of categorization can function concurrently to classify coping techniques, and their ideas can be seen below in Table 7.

Table 7: Reclassifying Coping

	Problem Focused Coping	**Emotion Focused Coping**
Attention Strategies	Planning Seeking instrumental support Task oriented coping Active coping Confrontive coping	Cognitive restructuring Seeking emotional support Turning to religion Acceptance Positive Reinterpretation
Avoidance Strategies	Problem avoidance Behavioral disengagement	Denial Distancing Mental disengagement Wishful thinking Social withdrawal

Nes and Segerstrom (2006)

In summary, coping involves recurring attempts to change the source of stress or one's cognition of that source. The research on principals and coping has focused heavily on checklists and surveys, with some useful categorizations of coping techniques being produced. More recent researchers have urged the narrative approach to studying coping because of the richer and more detailed data that can be elicited from such an inquiry.

Yoga and Stress

Yoga is a 4000 year old mind-body intervention from the Indian subcontinent that encompasses a system of discipline and meditation designed to generate spiritual experience and insight (Chong, Tsunaka, Tsang, Chan, & Cheung, 2011). Joshi and DeSousa (2012) focused on yoga's ability to promote integrity within the different aspects of the human person: "The yoga practices were designed to facilitate development and integration of the human body, mind, and breath to produce structural, physiological, and psychological effects" (p. 3). Feuerstein (2001)

further defined yoga as a "psycho-spiritual technology" (p. 6) that includes spiritual values, teachings, and techniques to produce a transformation of consciousness to liberate the individual from the disillusionment of the ego-personality. Specifically, Feuerstein (2001) restricts the meaning of the word yoga to mean Classical Yoga, the enlightenment philosophy codified by the sage Patanjali that stands alongside the other five orthodox philosophies of enlightenment that hail from India, i.e. yoga is one of the *shad darshana* (six viewpoints) of Indian philosophy.

Patanjali outlines two practices of yoga: 1) *Kriya Yoga*, which has the three parts of *tapas* (ascetic disciplines), *svadhyaya* (self-study, including mantra practice), and *ishvara-pranidhana* (surrender to a deity); and the more well-known 2) *Ashtanga Yoga* (Eight-limbed Yoga), which includes a) *yamas* (moral practices), b) *niyamas* (practical observances including those of Kriya Yoga), c) *asana* (the physical postures), d) *pranayama* (breath control), e) *pratyahara* (interiorization of the senses), f) *dharana* (concentration), g) *dhyana* (meditation), and h) *samadhi* (supreme unity with the object of perception) (Desikachar, 1995). In this researcher's experience, when people not conversant with yoga talk about yoga, they are often referring solely to the *asanas* (physical postures); however, yoga technology includes a wide variety of techniques, of which pranayama is just one.

Yoga first appeared on the western stage after Swami Vivekananda, who highlighted yoga's health benefits and universal accessibility, spoke at the World Parliament of Religions in Chicago in 1893 (Semich, 2012). Even though yoga has grown in popularity, it was not significantly researched by the scientific community in the United States until Transcendental Meditation began to be studied in 1963 (Brown & Gerbarg, 2009), though yoga's medical applications had been studied in India starting as early as 1918 at the Yoga Institute of Versova

near Mumbai (Khalsa, 2004). Since then, scientific research on yoga has expanded into its multifarious potential benefits, but much of the research has the potential risk of bias or has been deemed poor research by reviewers (Ernst & Lee, 2010).

Either desiring to promote general wellness or to manage a disease, an estimated 7.5% of the United States population has practiced yoga at least once (Chong, Tsunaka, Tsang, Chan, & Cheung, 2011). Khalsa (2004) categorized the majority of clinical research on yoga, much of which was conducted in India, into three broad categories: psychiatric conditions, cardiovascular disorders, and respiratory disorders. The medical community in the United States has been doing research into the wide variety of yoga's potential applications in the treatment of disease, including, but not limited to, "anxiety, arthritis, back pain, cardiovascular problems, gastrointestinal complaints, headaches, insomnia, premenstrual syndrome, respiratory problems, and stress" (Ernst & Lee, 2010, p. 274). Yoga practice has also shown positive results in reducing the symptoms of depression (Balasubramaniam, Telles, & Doraiswamy, 2013; Brown & Gerbarg, 2005; Pilkington, Kirkwood, Rampes, & Richardson, 2005) and those of anxiety (Brown & Gerbarg, 2005; Joshi & De Sousa, 2012; Kirkwood, Rampes, Tuffrey, Richardson, & Pilkington, 2005).

Hayes and Chase (2010), in considering how yoga might function to reduce stress, offered two possibilities: 1) the inward focus that yoga offers may buffer the individual from the external stimuli that may be causing the stress, and 2) the pranayama may deactivate the physiological mechanisms that trigger the sympathetic nervous system. They also link stress to the prevalence of generalized anxiety disorder in their discussion. Joshi and DeSousa (2012) saw yoga as an effective tool in treating stress because of its ability to contribute to a state of

calm alertness, its ability to stimulate the parasympathetic nervous system, and its ability to calm the body's stress response.

The studies on yoga's effect on stress have shown promising results. Lee, Mancuso, and Charlson (2004) surveyed 171 participants in a community yoga program in New York City using the Medical Outcomes Short Form-36 and found that participants who took an average of 24 asana classes (with 10 minutes of meditation) over a period of three months (approximately two classes per week) reported that they had fewer depression and anxiety symptoms, greater self-advocacy, and improvements in health-related quality of life. Although there was no control group and they did not use a stress specific measure, the results are indeed promising. Waelde, Thompson, and Gallagher-Thompson (2004) used a yoga intervention with 12 female caregivers of patients suffering from dementia, an intervention that included gentle asanas (stretching), pranayama, mantra, guided imagery, and meditation. While admitting that the results should be viewed cautiously because there was no control group, the researchers discovered that the program reduced stress by reducing both anxiety and depression and increasing self-advocacy among the participants, with large effect sizes for each of these three measures ($d = 1.02$ for anxiety, .68 for depression, & .66 for self-advocacy).

More recently, Smith, Hancock, Blake-Mortimer, and Eckert (2007) found in a sample of 131 South Australians suffering from mild to moderate stress that 10 weekly one-hour sessions of Hatha yoga (a yoga system consisting primarily of asana, breath awareness, and internal centering) were as effective at reducing stress as 10 one-hour sessions of relaxation every week, with additional mental health benefits in the yoga group after the 10 weeks of the intervention. Chong, Tsunaka, Tsang, Chan, and Cheung (2011) reviewed eight randomly and clinically

controlled experiments and concluded that yoga has a positive effect in reducing stress symptoms and perceptions of stress but cautioned that because the intervention durations were short, the number of studies few, and the follow-up data limited, these results should be interpreted with care. Bilderbeck, Farias, Brazil, Jakobowitz, & Wikholm (2013) taught one yoga class per week to 45 participants from seven British prisons over a ten week period and found that compared to a workout control group (n=55), the intervention group experienced both increased positive affect and decreased self-reported stress on the PSS ($p < .041$).

Other studies have used physiological indicators of stress to suggest that may indeed reduce stress and suggest that even a short term yoga intervention can have a significant impact. Vempati and Telles (2000) combined yoga postures with relaxation and lectures on stress and yoga philosophy in a two-day intervention with a group of 26 middle managers in India to discover a significant reduction in breath rate in all participants as well as an increase in high frequency heart rate variability in those who scored above the median on the Occupational Stress Index--both results suggest reduction in sympathetic dominance and thus reduction in stress. Granath, Ingvarsson, von Thiele, and Lundberg (2006) combined self-reported data and physiological data (adrenaline and noradrenaline in the urine, salivary cortisol, systolic blood pressure, diastolic blood pressure, and heart rate) in their 10 week study of 38 participants comparing the stress benefits of weekly cognitive behavioral therapy to a weekly yoga intervention involving asanas for the back and shoulders and some breathing. They found that yoga and cognitive behavior therapy performed equally well in reducing stress, with a medium to large effect size on the self-reported tests ($p < .001$ for cognitive behavioral therapy and $p < .01$ for yoga on the PSS) and a small to medium effect size on the physiological indicators; however,

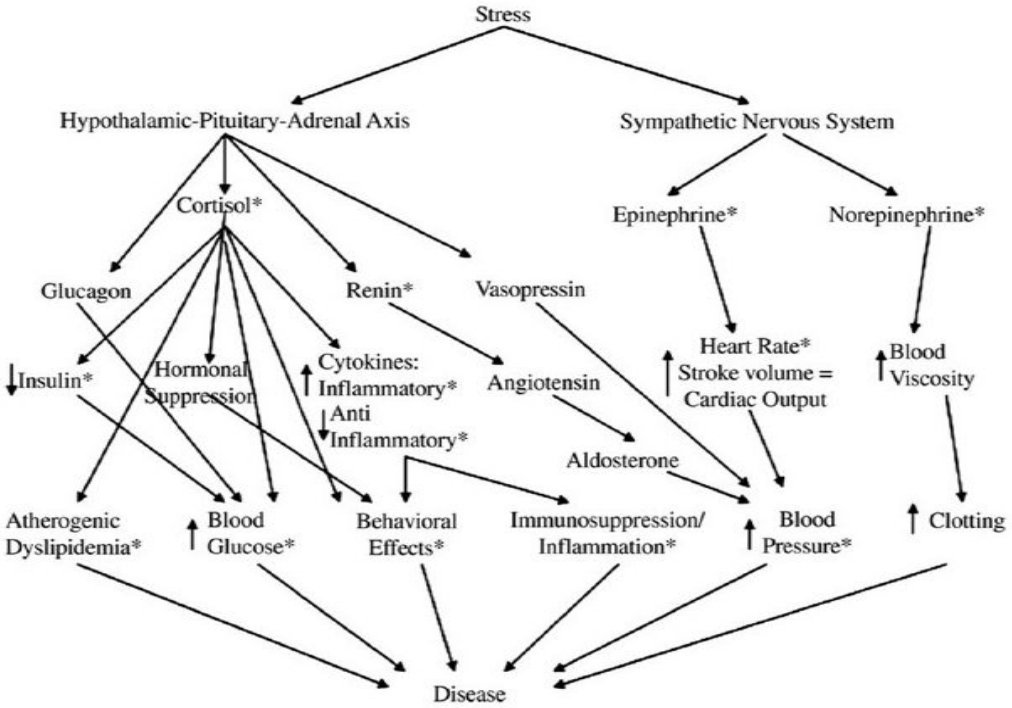
because there was no control group, these results might be attributable to other factors, e.g. regression towards the mean or seasonal variations. Satyapriya, Nagendra, Nagarathna, and Padmalatha (2009) examined the perceived stress and heart rate variability of pregnant women assigned to either a yoga group who practiced asana, pranayama, and meditation or a control group who practiced standard prenatal exercises, with both groups practicing for an hour each day. The yoga group reported a 31.57% reduction in stress as measured by the Perceived Stress Scale (PSS) in contrast to the control group with a 6.6% increase ($p < .001$). Furthermore, high frequency heart rate variability increased significantly in the yoga group ($P < .001$), suggesting increase in parasympathetic activity and reduction in stress. David (2013) discovered that a mild yoga intervention of only 20 minutes a day for four weeks produced decreases in both heart rate and the frequency and severity of headaches, which are linked to stress, in comparison to both a walking control group and a wait-list control group.

Researchers have also used cortisol levels to ascertain the effectiveness of yoga practice in reducing stress. West, Otte, Geher, Johnson, & Mohr (2004) compared the perceived stress, affect, and cortisol levels of college students who either participated in an African dance class, a yoga class, or a biology lecture. They discovered that both African dance and yoga significantly reduced perceived stress as well as negative affect; however, only the yoga class significantly reduced cortisol levels in the saliva, with cortisol being one of the hormones that is released in the stress response. Unfortunately, the participants were not randomly assigned in the study and the techniques used in the Hatha yoga class were not described, so the results must be considered preliminary. Banasik, Williams, Haberman, and Blank (2011) also looked at cortisol levels in the saliva of breast cancer survivors who practiced Iyengar yoga 90 minutes a day twice a week

for eight weeks and found that the intervention group had significantly lower morning and 5pm cortisol levels compared to the wait-list control group. The yoga group also reported improvement in emotional well-being and a reduction in fatigue. The sample size was small: nine people in each group, but the results were encouraging. A fascinating study by Rocha and colleagues (2012) compared 17 participants in the Brazilian army who practiced 60-minute yoga sessions twice per week over a period of six months to a physical activity control group (n=19); they discovered that the intervention group showed significant improvements in measures of short and long term memory, depression, anxiety, stress ($p < .001$), and salivary cortisol levels ($p < .001$).

Yoga practices have been shown to have positive effects on many physiological indicators of stress. Refer to Figure 1 below for a summary of that research.

Figure 1: Summary of Yoga's Benefits in the Stress Response



Yoga has been shown to positively influence items marked with *. (Sengupta, 2012).

Several studies suggest that prolonged yoga practice may have additional protective benefits to practitioner against stress, i.e., experienced yoga practitioners may build up a physiological stress buffer. Streeter, Jensen, et al. (2007) compared γ-aminobutyric (GABA) levels in experienced yoga practitioners after a 60-minute asana class to those of an 11 person reading control group. The authors noted that other researchers have previously found that GABA levels are low in people suffering from stress related disorders like depression and anxiety. After one yoga class, the researchers saw a 27% increase in GABA levels compared to the control group. What was particularly interesting was that the yoga practitioners had different levels of experience and were from different schools of yoga, a finding that led the researchers to conclude that the increase in GABA levels might be related to the asana and pranayama that was practiced rather than the particular school of yoga. In a follow-up study to this one, Streeter, Whitfield, et al. (2010) compared a randomly assigned group of inexperienced Iyengar yoga practitioners to a randomly assigned group of metabolically matched walkers, each of which practiced for 60 minutes three times a week for 12 weeks. Iyengar yoga has primarily static postures with breathing in each posture. The yoga group experienced improvements in mood and decreases in anxiety compared to the control, and the yoga group also showed a 13% increase in GABA levels after 12 weeks of practice. The researchers concluded that the benefit may not be attributed to metabolic activity alone.

Experienced yoga practitioners may indeed have other physiological benefits that protect against the negative effects of stress. Kamei et al. (2000) looked at eight experienced yoga practitioners who practiced asana for 15 minutes, pranayama for 15 minutes, and meditation for 20 minutes. After the practice, their cortisol levels decreased significantly ($p < .05$), indicating

physical relaxation, and the incidence of alpha brain waves increased during the practice ($p < .005$ for asana, $p < .0005$ for pranayama, and $p < .0001$ for meditation), indicating mental relaxation; the alpha waves were compared to the participants own brain patterns at rest. Another study by Kiecolt-Glaser and colleagues (2010) compared inflammatory responses, which can be indicators of stress, of an asana practitioner group to a control group who walked. While they found that there was no immediate difference in the inflammatory response between the asana practice group and the walking control group after practice or exercise, they did discover that expert yoga practitioners had considerably fewer markers of inflammation in their blood compared to novice yoga practitioners, a result that suggested that prolonged yoga practice has benefits in reducing stress.

Semich (2012) produced a dissertation that argued that a multi-modal yoga practice combining asana, pranayama, and meditation may be more effective than an asana only practice in reducing stress. Using a purposive sample of 97 adults from Palm Beach county assigned to one of three groups (asana, asana-pranayama-meditation, and control), she discovered using the PSS that both yoga groups reduced their stress significantly more than that of the control group ($p < .01$) and that multi-modal group significantly outperformed the asana only group in perceived stress reduction ($p < .038$).

In summary, yoga is an ancient system with multiple definitions ranging from the spiritual to the practical, possessing many different techniques, including asana (physical exercises and postures), pranayama (regulated, slow breathing), and meditation. Yoga was initially studied for its clinical benefits in India and has been studied worldwide for its help in alleviating distress in many diseases. Its ability to promote inner focus and alertness as well as to

block to stress response may account for its success in reducing stress. Stress and yoga research has focused on both yoga's successes in reducing perceived stress of participants, using the PSS and others, as well as on reducing the physiological indicators of stress, including reducing salivary cortisol, heart rate, and blood pressure, and increasing high frequency heart rate variability and GABA. Experienced yoga practitioners may enjoy additional benefits in stress prevention, and multi-modal practice of yoga seems to be better than asana alone in reducing stress.

Pranayama and Stress

Pranayama comes from the sanskrit words meaning "extension of life force" and was chiefly practiced by yogis as breath regulation combined with internal focus and concentration (Feuerstein, 2001). Sharma (2007) quoted Patanjali, the author of the *Yoga Sutras*, to define pranayama: "That pranayama is of three modes; external, internal and the suspension (of breath); observed by locus (place of awareness and concentration in the body), duration, and count, (breath is made) long and subtle (2:50)" (p. 75). Brown and Gerbarg (2009) summarized that the yoga tradition understands that there is a connection between the mind and the breath, i.e. a person can influence the mind through the manipulation of the breath and that pranayama acts by cleaning out the *nadis* (subtle channels) of the energetic body and by increasing oxygenation to strengthen the physical body. They also gave an overview of some of the different kinds of breathing practices: abdominal breathing, airway resistance breathing, breathing in different postures, breath suspension, and single or alternate nostril breathing. Jerath, Edry, Barnes, & Jerath (2006) described pranayama as a low-risk, cost-effective treatment that can reduce stress and summarized the myriad other health benefits that researchers have identified: improving

heart and lung functionality, reducing oxygen consumption, decreasing symptoms in irritable bowel syndrome, lowering metabolic rate, and ultimately enhancing parasympathetic activation.

The human autonomic system has two subsystems that work in opposition to each other: the sympathetic nervous system ("flight or fight"), which gets activated in stressful situations and exercise and the parasympathetic nervous system ("rest and digest"), which operates during restful periods of time (McCorry, 2007). Regular practice of pranayama has been shown to increase parasympathetic and decrease sympathetic activity, improve heart and breathing functions, reduce the effects of stress. (Pal, Velkumary, & Madanmohan, 2004; Sengupta, 2012). Brown & Gerbarg (2005), in their review of the literature, postulated that pranayama, via its five physiological aspects--slow breathing, contracting of the larynx, inspiration against resistance, expiration against resistance, and breath-retention--functions to stabilize the stress response system, to stimulate the vagal nerve and to increase parasympathetic dominance, to quiet areas of the brain associated with anticipation and worry, to release hormones oxytocin and prolactin that enhance calmness and social bonding, and to cause the limbic system of the brain to have emotional release.

Multiple studies have been done on one popular pranayama technique called alternate nostril breathing (ANB) during which participants inhale through the left nostril, hold both nostrils closed, exhale through the right nostril, hold both nostrils closed, and then repeat in reverse order, and these studies repeatedly show a move towards parasympathetic dominance after both one instance of practice and after several weeks of consistent practice, with effects including improved vital capacity and problem solving ability as well as reduced heart rate, respiratory rate, and blood pressure (Hayano et al., 1994; Singh, Gaurav, & Parkash, 2011;

Srivastava, Jain, & Singhal, 2005; Subbalakshmi, Saxena, Urmimala, & D'Souza, 2005; Upadhyay Dhungel, Malhotra, Sarkar, & Prajapati, 2008). However, Ghiya and Lee (2012), in an attempt to discover whether the effect was caused by the technique or simply by the slowing of the breath, examined 20 healthy yoga novices in their early 20s who breathed with ANB or paced breathing (PB) in a random order for 30 minutes. Both sets of individuals were breathing at a rate of five breaths per minute, or one breath every 12 seconds. The researchers found that both breathing techniques had the same effects on the physiology and concluded that the benefits from ANB are attributable to the slowing of the breath rather than from the nostril technique itself.

Indeed, one of the key mechanisms of pranayama may be the slowing down of the breath. Bhavanani, Sanjay, and Madanmohan (2011) studied 23 patients with essential hypertension (high blood pressure) who ranged in age from 45 to 70. The participants performed five minutes of seated sukha pranayama (consciously regulating the inhale and exhale to an equal ratio) at a rate of six breaths per minute or one breath every 10 seconds. After only five minutes of breathing, the participants experienced a significant drop in systolic blood pressure and heart rate. Similarly, Hayano and colleagues (1994) found that the simple intervention of slowing the breath down from one breath every three seconds to one breath every six seconds produced a significant increase in high frequency heart rate variability, i.e. increased parasympathetic activity. Similarly, Joseph and colleagues (2005) found that in hypertension patients, only two minutes of slow breathing was able to reduce blood pressure and increase baroreflex sensitivity. One of the mechanisms associated with autonomic imbalance towards the sympathetic nervous system is the baroreflex, the body's mechanism for regulating immediate blood pressure

changes, and increasing the sensitivity of the baroreflex could indicate increased parasympathetic activity. Driscoll and Dicicco (2000) reported that eight university student and staff participants with normal blood pressure who practiced paced breathing with the assistance of a metronome at the rate of one breath every five seconds, i.e., 12 breaths per minute, experienced increased parasympathetic activity because their high frequency heart variability increased ($p < .04$). The normal breathing rate in healthy adults is 12 - 15 breaths per minute (Sharma, 2007).

However, other studies have suggested that nostril of inhale or exhale may change the effect on the autonomic nervous system. For example, Raghuraj & Telles (2008) studied 21 adult male volunteers with three months of residential yoga training. The participants engaged in 30 minutes of pranayama practice utilizing either ANB, right-nostril breathing (RNB--participants inhale and exhale exclusively through the right nostril, with the left nostril gently occluded), and left nostril breathing (LNB--participants inhale and exhale exclusively through the left nostril, with the right nostril gently occluded). Participants had higher blood pressure after right nostril breathing, suggesting an increase in sympathetic activity, while those who practiced LNB and ANB had decreased blood pressure. The implication is that breathing through the left nostril or alternate nostrils creates a parasympathetic tilt while breathing through the right nostril creates a sympathetic tilt.

The pranayama used in this intervention is called Ujjayi pranayama. Ujjayi pranayama was mentioned in the *Hatha Yoga Pradipika*, a classic text on Hatha yoga, as one of the eight ways to practice pranayama (Tomar & Singh, 2011). The practice is characterized by a sound produced by a contraction of the larynx and a partial closure of the glottis, both of which increase airway resistance so that both inspiration and expiration can be lengthened to a precise count

(Brown & Gerbarg, 2005). Ujjayi breath is superior to simple slow breathing because the increase in intrathoracic pressure enhances oxygen absorption and because Ujjayi allows for greater control over the airway, enabling one to slow the breath rate more easily (Mason, et al., 2013). However, it must be noted that Mason and her colleagues (2013) found that although oxygen saturation was superior in 17 yoga novices who practiced Ujjayi at the rate of one breath every 10 seconds, slow breathing without Ujjayi at the same rate showed a slightly better improvement to baroreflex sensitivity than the improvement gained from practicing Ujjayi pranayama. Asymmetrical and symmetrical breathing patterns were discussed by these authors as well, and they suggested that a comfortable breath ratio be adopted by the practitioners, with a 5 second exhale as a minimum needed to achieve these improvements.

Although Ujjayi pranayama has often studied in conjunction with multiple breathing techniques, a few studies have attempted to isolate the effects of Ujjayi specifically. Lathadevi, Maheswari, & Nagashree (2012) had an experimental group of 30 healthy males practice 5-10 minutes of Ujjayi pranayama twice a day, with a subsequent period of 10 minutes of relaxation in the supine position. Versus the control group of 30 healthy males who had no intervention, the experimental group experienced a significant reduction ($p < .0001$) in heart rate, blood pressure, and pulse pressure after only six weeks of practice. Another study divided 30 female undergraduates into two groups, with the experimental group practicing ujjayi pranayama for 30 minutes a day for eight weeks (Tomar & Singh, 2011). The experimental group showed a significant reduction in both heart rate and pulse rate ($p < .05$) versus a control group with no intervention, but there was no significant decrease in blood pressure in this study. Ujjayi

pranayama has also been effective in treating patients with asthma (Lathadevi & Maheshwari, 2012).

Practicing a mixture of pranayamas has been shown to reduce both perceived stress and some physiological indicators of stress. Bhimani and colleagues (2011) studied 59 medical students who were instructed to practice seven different breathing techniques including Ujjayi pranayama for one hour per day, five days a week, for two months. Using a pre-test and post-test, the researchers noted that the students reduced their stress significantly on 12 of the 20 questions of their in-house stress questionnaire. They also observed that heart rate variability changed significantly; low-frequency heart rate variability decreased, suggesting less sympathetic stimulation, and high-frequency heart rate variability increased, suggesting more parasympathetic stimulation. They did not utilize a control group in their study. Sharma, Trakroo, et al. (2013) randomly assigned 90 college students into three groups--a fast pranayama group, a slow pranayama group, and a control group, with both pranayama groups practicing 30 minutes per day, three times per week, for 12 weeks. Although both pranayama groups significantly decreased their scores on the PSS in comparison to the control group, only the slow pranayama group also showed significant improvements with respect to the measured physiological variables, including reduced heart rate and blood pressure. Sharma, Rajajeyakumar, et al. (2014), in a similarly designed study, found that in addition to significantly reduced stress scores on the PSS, both fast and slow pranayama groups improved on measures of reaction times and executive functioning relative to controls.

Practicing pranayama or a mixture of pranayamas has also been shown to reduce indicators of anxiety, one of the consequences of stress. Jana & Mitra (2013) compared the state

and trait anxiety of 34 women who practiced 45 - 60 minutes of pranayama per day for four days a week over 15 weeks to a control group of 20 women. Both state and trait anxiety was reduced after the intervention ($p < .05$). Nemati (2013) divided 107 masters students into an experimental group and a control group and practiced pranayama with mantra and visualizations to the experimental group at the start of every class of the semester. The incidence of students who experienced high test anxiety in the experimental group was half that of the control group by the end of the semester, and the experimental group had significantly lower mean test anxiety scores. Sharma, Azmi, and Settiwar (1991) trained 71 people suffering from anxiety a mixture of ujjayi and kapalabhati pranayama which they practiced for 10 minutes twice a day over a period. Relative to the control group who received a placebo pill, the experimental group experienced significant reductions in their anxiety after 3 weeks ($p < .005$) and again after 6 weeks ($p < .01$) (Sharma, Azmi, & Settiwar as reported in Kirkwood, Rampes, Tuffrey, Richardson, & Pilkington, 2005). In another study, 60 software executives were assigned to either a control group that attended group therapy or an experimental group that combined group therapy with both pranayama and Sudarshana Kriya, a set of techniques codified by Shri Shri Ravi Shankar (Vedamurthachar, Damodaran, Lakshmanan, & Kochupilla, 2013). After one month of practice, the experimental group reported significantly less anxiety than the control group.

Sudarshana Kriya Yoga (SKY), particular mixture of pranayamas that has been advocated by the Art of Living Foundation, has been studied frequently and has shown promising results. Brown and Gerbarg (2009) posited from the conclusions of smaller studies that SKY encourages neurogenesis, neuroplasticity, emotional adaptation, learning, and even recovery from trauma. They added a list of longevity benefits as well: better lipid profile and

immune system functioning as well as possible antioxidant effects of SKY. They also reported that SKY has made significant positive differences for those suffering from post traumatic stress syndrome and depression. The first pranayama in the SKY sequence is Ujjayi breath.

It must be noted that breathing instructions can influence the outcome of the pranayama practice. Conrad et al. (2007) examined 43 participants and gave them one of four different instructions on how to breathe: direct attention to the breath, breathe more slowly, breathe more shallowly, or breathe more slowly and more shallowly. The two groups with instructions for shallow breathing experienced more anxiety and tension, while the group given the instruction to pay attention to the breath improved their respiratory stability and slowed their breathing rate. The authors also concluded that a short and simple instruction to slow the breath down does not produce the desired result; more instruction may be needed to achieve this goal.

One possible aide to help slow the breath down, in addition to instructing the participant to pay more attention to the breath, might be the use of a metronome during pranayama practice. Recent research suggested that an external auditory stimulus produced by a metronome stabilized the breath during cycling exercises (Bardy, Hoffmann, Moens, Leman, & Dalla Bella, 2015), and it may be that the use of the metronome will have a similar effect of slowing the breath while sitting still. Brown and Gerbarg (2005) also pointed out that the laryngeal contraction that takes place during Ujjayi breath also aides in the slowing down of the breath.

In summary, pranayama has been developed within the yoga tradition as a means to positively influence the physical, energetic, and mental aspects of the human body through concentration, internal focus, regulation of the breath rate, increased oxygenation, and parasympathetic activation. Pranayama has been shown to have positive effects on both

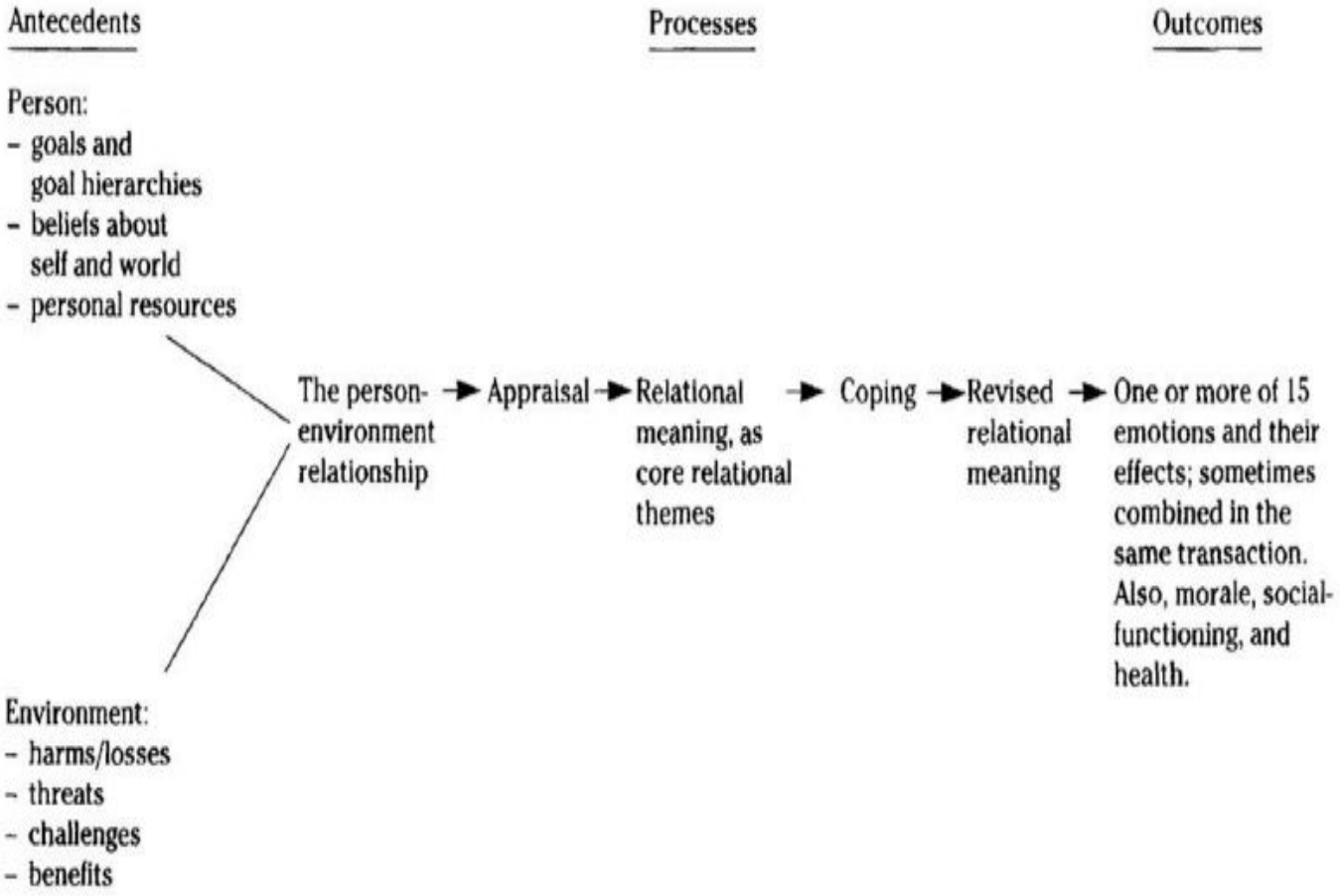
perceived stress and the physiological indicators of stress, and two popular techniques alternate nostril breathing (ANB) and Ujjayi pranayama have shown great benefit in stress research and in the research of other pathologies. The most important mechanism for attaining the positive benefits of the techniques seems to be the slowing down of the rate of breath. Recent research has supported the claim from *Nathamuni's Yoga Rahasya* that pranayama produces a stable mind, freedom from suffering, and a longer life (Desikachar & Krishnamacharya, 1998).

Stress, Emotions, and Yoga

Emotions may play a bigger part in the stress process than was previously thought, and much research has explored the expanded role of emotions. In light of these new findings, a brief discussion of the new models of stress that include emotions as well as a review of some of the research that discusses how yoga as an integrated system and pranayama specifically impact emotions is necessary.

Lazarus (2006) modified his original theory of stress appraisal to make it more comprehensive in light of the research since his earlier work: Lazarus and Folkman (1984). He added some causal antecedents in order to more successfully capture emotional responses as well as outcomes that included immediate and long-term emotional responses. Attempts were also made to integrate resource models of stress. See Figure 2 below, in which Lazarus (2006) catalogues and links the causal antecedents of stress to the appraisals and coping and links these appraisals and coping to the subsequent outcomes of stress.

Figure 2: Revised Transactional Model of Stress to Include Emotions



Lazarus (2006), p. 198

Lazarus (2006) highlighted the absurdity that stress and emotions are studied as two different research fields because of the interdependence between the two phenomena: where there is stress, there is emotion, and vice versa. Certain emotions, like anger and anxiety, can be termed *stress emotions* because they usually originate from stressful situations, i.e. situations that have been appraised as threatening. Indeed, he redefines the field by declaring: "The three concepts stress, emotion, and coping belong together and form a conceptual unit, with emotion

being the superordinate concept because it includes stress and coping" (p.37). He also advocated for a narrative approach to studying both appraisals and emotions.

Gross (1998) reviewed the body of research on emotions to produce a working definition of *emotion regulation*: "Processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (p. 275). Gross (1998) stated that this process can be conscious or unconscious and can happen automatically or within a person's control. Wang and Saudino (2011) attempted to refine Lazarus's (2006) all inclusive statement about emotions, stress, and coping in the following ways: 1) coping differs from emotion regulation in that it is broader--coping seeks to regulate emotions *and* deal with external events, whereas emotion regulation does only the former action, 2) regulations of stress reactions are linked developmentally to emotion regulation, and 3) both stress and emotion regulation are linked to the same physiological system, the hypothalamic–pituitary–adrenal (HPA) axis--stress can activate the system and emotion regulation can predict levels of cortisol, the product of the HPA axis, 4) both cognitive and emotional systems are involved in the reappraisal process, i.e. reappraisal has an emotional component, and 5) both stress and emotion regulation activate the same parts of the brain, namely the prefrontal cortex (PFC) as well as the anterior cingulate cortex (ACC) and the amygdala, both of which are associated with emotion.

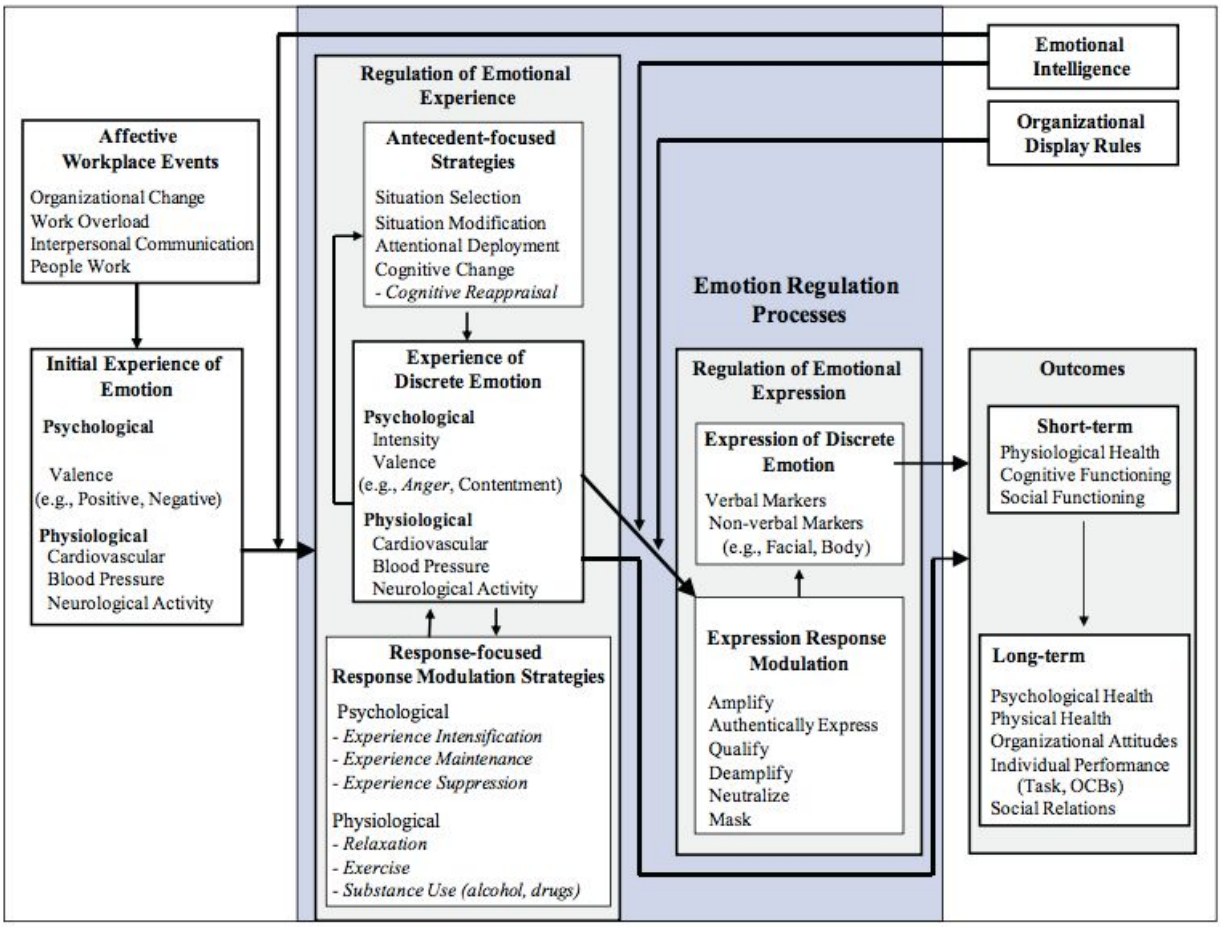
Emotion regulation has five categories of strategies: 1) situation selection and avoidance (e.g., avoiding a colleague who tells bad jokes), 2) situation modification (e.g., asking that colleague to stop telling a bad joke), 3) cognitive change and reappraisal, including denial, isolation, intellectualization, downward social comparison, and cognitive reframing (e.g., saying to oneself that there are worse things than hearing a bad joke), 4) attention deployment and

allocation, including the three subcategories of distraction, concentration, and rumination (e.g., staring at a balloon and ignoring the bad joke), and 5) response modulation and suppression, including drugs, exercise, relaxation, food, and regulating emotion expressive behavior (e.g., eating a cookie to deal with the person telling the bad joke) (Gross, 1998; Lawrence, Troth, Jordan, & Collins, 2011; Scheibe & Zacher, 2013). The three most commonly studied techniques of emotion regulation have been reappraisal, attention allocation, and suppression (Menezes, et al., 2015). The suppression or inhibition strategy is perhaps the worst for the individual, for it leads to "maintenance or increased experience of negative emotions, decreased (but often not totally masked) behavioral expressions of negative emotion, increased stress physiology (e.g., sympathetic activation of the cardiovascular system, blood pressure), poorer memory and thought processes, and decreased social functioning" (Lawrence, Troth, Jordan, & Collins, 2011, pp. 202-203). Of the two remaining strategies, attention allocation seems to deactivate the amygdala more than reappraisal, and attentional allocation may be the cornerstone which supports all the other aspects of emotion regulation (Menezes, et al., 2015). Emotional regulation strategies have been shown to be effective against burnout in the workplace: both refraining from thinking about work when not at work and situation modification can reduce emotional exhaustion (Scheibe & Zacher, 2013).

Lawrence, Troth, Jordan, and Collins (2011) reviewed the research on emotion in the five fields of social psychology, developmental psychology, neuropsychology, health psychology, and clinical psychology in order to create a model of emotions in the workplace, effectively eliminating the ideas of stress and coping and replacing them with a model of successful or

unsuccessful emotion regulation. Figure 3 below encapsulates their model, and an explanation follows below.

Figure 3: Framework of Emotion Processes in the Workplace



Lawrence, Troth, Jordan, and Collins (2011), p. 199

A workplace event happens (Affective Workplace Events) which produces an emotional response (Initial Experience of Emotion) that has both a psychological and a physiological component. Emotional Intelligence then comes to bear on that initial experience, directing the individual to deploy either strategies to cope with the cause (Antecedent Focused Strategies) or to cope with the emotion itself with psychological or physiological strategies (Response Focused Strategies). Depending on the success of these strategies or lack thereof, an individual may still

experience both the psychological and physiological manifestations of that emotion (Experience of the Discrete Emotion). Depending on that person's emotional intelligence and the rules around emotion expression in the workplace (Organization Display Rules), a person may attempt to alter expression of the emotion (Emotional Response Modulation) before engaging in the communication of that emotion (Expression of Discrete Emotion). Emotions that are unresolved will have short term consequences that can affect physiological, cognitive, or social functioning and long term consequences that can affect psychological health, physiological health, attitude towards the organization, individual performance, and social relationships.

The organization of the above chart has similarities to Lazarus's (2006) model in that an event happens, an individual appraises the event, attempts to cope take place, and then outcomes happen; the chart simply operates through the lense of emotions and its processes. Problem-based coping corresponds to situation selection and modification, and emotion-based coping corresponds to attention deployment, cognitive change, and response modulation categories (Gross, 1998). Although emotion regulation and coping are similar constructs with similar effects, they do not overlap completely. Coping can include non-emotional actions for non-emotional goals, whereas emotion regulation can include actions that do not draw on an individual's resources and that are not always contained in the coping canon, e.g., sustaining positive emotions (Gross, 1998).

Brennan and Mac Ruairc (2011) argued that research on school leadership has relied too heavily on models from business and organizational theory, which marginalizes the role of emotions, and that the person-centered nature and unique context of the work of principals require research that considers the central role that emotions play in school leadership.

Unfortunately, two of the difficulties of studying emotion focused coping are that the absence of a widely-accepted instrument for measuring emotion-focused coping makes meta-analyses difficult and that emotion focused coping has consistently shown negative psychological outcomes (Austenfeld & Stanton, 2004). Austenfeld & Stanton (2004) argued that the reason for the negative outcomes is that coping questionnaires are confounded with distress and self-deprecation, so they responded by creating their own instrument that evaluates coping through acknowledging, understanding, and expressing emotions.

Several studies have been done to investigate the role of emotions for school principals. Brennan and Mac Ruairc (2011) surveyed 97 principals in Ireland and then followed up with semi-structured interviews with eight of the participants. They discovered that the actions of the principals were inseparable from their emotions and that emotions influence the decision-making process, the relationship the principal has with his or her staff, and the emotional climate of the entire school. Poirel and Yvon (2014) performed an innovative research project, filming six principals for an entire day and then having the principals answer questions about their experiences as they reviewed the videos a week later. The most common emotions in their sample were anger, which the principals chose to cope with by inhibiting the emotion for the sake of the school climate, and anxiety, which the principals also inhibited, but not by choice in the opinion of the researchers. Anger was experienced when the principals were reproached by staff and anxiety when the principals anticipated a worsening situation. Moreover, the researchers surmised that the loss of power that resulted from compromises made with staff in order to preserve the school climate may have had the emotional consequences of anxiety and loss of confidence.

Yoga has been shown to have positive effects on emotions. A ten week yoga intervention improved self-reported affect in a prison population (Bilderbeck, Farias, Brazil, Jakobowitz, & Wikholm, 2013). A one-hour yoga class once per week for six weeks produced significant improvements in seven of eight measures of mood and wellbeing for employees at a British university (Hartfiel, Havenhand, Khalsa, Clarke, & Krayer, 2011). Compared to a physical exercise control group, a yoga group who practiced an integrated routine of asana, pranayama, and devotional sessions for one hour daily six days a week for eight weeks significantly reduced their verbal aggressiveness scores ($p < .01$) (Deshpande., Nagendra, & Raghuram, 2008). Self-rated mental disturbance, tension-anxiety, and anger-hostility were lower in a group of women who had practiced yoga for two or more years compared to an age-matched control group with no yoga experience (Yoshihara., Hiramoto, Sudo, & Kubo, 2011). Adolescents who participated in 30-40 minute long yoga classes two to three times per week for 11 weeks showed significant improvements in both self-reported anger control and resilience compared to controls (Khalsa, Hickey-Schultz, Cohen, Steiner, & Cope, 2012).

Menezes and colleagues (2015) identified six potential mechanisms for yoga's success at enhancing emotion regulation: 1) the interplay of various techniques, namely, asana, pranayama, meditation, or mantra, enhances emotional regulation skills, 2) the spiritual teachings of yoga creates new reappraisal strategies and helps with emotional regulation, 3) yoga fosters attention allocation strategies that allow the individual to avoid or disengage from negative stimuli, 4) yoga increases the ability to regulate attention, 5) yoga's ability to promote acceptance operates as an antagonist to both rumination and the suppression of emotions, 6) by the reduction of sympathetic activity, yoga reduces anxiety, which can interfere with the regulation of emotions,.

Pranayama practice in and of itself might operate to reduce emotional intensity and increase emotional stability directly; however, there is surprisingly little research investigating pranayama and emotions. Betal (2015) argued that with pranayama, there is a reduction in limbic system arousability, which causes emotional reactions to come under control automatically. This effect, combined with the down-regulation of both the HPA axis and the sympathetic nervous system, allows for better cognitive change and emotion responsive behavior; and pranayama activates the anterior cingulated cortex (ACC), associated with processing of distractions, and the medial prefrontal cortex (mPFC), associated with processing of emotions. Thus, pranayama practiced with awareness and mindfulness should promote better attention regulation. Brown and Gerbarg (2005) also stressed that better vagal activity, associated with the parasympathetic nervous system, corresponds to better attention and emotion processing.

In summary, stress and coping may be equivalent experiences to emotions and the regulation of those emotions, and models of workplace stress have been constructed that either attempt to integrate emotions into the stress cycle (Lazarus, 2006) or to frame the inquiry completely from the point of view of the emotion process (Lawrence, Troth, Jordan, and Collins (2011). Emotion regulation strategies correspond to coping processes. Researchers have demonstrated yoga's calming effects on emotions, and theorists argue that yoga and pranayama help the emotion regulation process by directly affecting the brain's physiology and by increasing one's ability to control attention.

Breath, Formation, and Catholic Schools

The breath has been an important symbol in Catholic thought since the first stories of its traditions. Early references in the *Book of Genesis* associate the breath with life; "the breath of life" is a recurring phrase through much of the text (*Gen*. 1:30, 2:7, 6:17, 7:15, etc.), and death is marked by the absence of the breath, e.g. "Abraham breathed his last and died in a good old age" (*Gen*. 25:8 as translated in Coogan, Bettler, Newsom, & Perkins, 2007, p.45; see also *Gen*. 25:17, 35:18, 35:29, etc.). Coogan and colleagues (2007) pointed out that in the Hebrew Scriptures there is constant wordplay with Hebrew word *ruah* that can mean "breath," "wind," or "spirit" (p. 1234).

In the Christian scriptures the breath becomes associated with the Holy Spirit: "He breathed on them and said to them, 'Receive the Holy Spirit'" (*John* 20:22, Coogan, Brettler, Newsom, & Perkins, p. 1915). The Greek word *pneuma*, much like the Hebrew word *ruah*, means both "breath" and "spirit" (Liddell & Scott, 1896), and it is precisely this word that is used in the ancient Greek versions of the Bible to reference the Holy Spirit (e.g., Marshall, 1993, p. 338). The name Holy Spirit could just as easily been translated as the Holy Breath. Emphasizing the importance of scripture, the gospel writer Paul also describes all scripture as the breath of God (*2 Tim*. 3:16). Thus, the image of the breath holds a preeminent place in the Christian scriptures.

Early Christian mystics also used the breath as a tool for spiritual advancement, similar to the way that the Indian mystics used pranayama. In the *Directions to the Hesychasts,* a text attributed to the monks Callistus and Ignatius which is contained in the *Philokalia*, a collection of writings by Christian desert monks, one of the spiritual techniques that is mentioned involves

entering the heart through attention to the breath which is supposed to aid the concentration of thoughts: “So, sitting down in your cell, collect your mind, lead it into the path of the breath along which the air enters in, constrain it to enter the heart together with the inhaled air, and keep it there” (Kadloubovsky & Palmer, 1951, p.192). The technique described, with its internal focus, concentration, and holding of the breath after inhale, very much so resembles how pranayama is practiced. Similarly, in the same collection of texts, Nicephorus the Solitary in his *Profitable Discourse on Sobriety*, emphasizes that focus on the breath allows the spiritual aspirant to focus on the heart and enter the kingdom of God (Kadloubovsky & Palmer, 1951, p. 33). These monks also combined the breathing technique with an internal invocation to Jesus Christ, in effect linking a mantra to the breath. The same linking of pranayama and mantra was also practiced by the Indian yogis (Desikachar & Krishnamacharya, 1998; Feuerstein, 2001). Early Christian mystics were using the breathing techniques to improve focus and concentration and to attain higher spiritual states of being. Because *de facto* pranayamas were being practiced in the early Church, there should be no religious objections to practicing these techniques again in the 21st century.

Church documents on education suggest that educators and principals ought to be looking to the latest techniques in science to improve their craft. In his text *On Christian Education*, Pius XI (1929) stated that the methods of science are in complete harmony with the Church (Section 28), and pranayama, though it originated in another culture, has recently been studied and its many health benefits affirmed by scientists (Sengupta, 2012). Indeed, the Sacred Congregation for Catholic Education (1982) stated that their analysis pertains to those involved in directing the school (Section 15), and their analysis focuses on the formation of the educator:

> The Catholic educator has an obvious and constant need for updating: in personal attitudes, in the content of the subjects, that are taught, in the pedagogical methods that are used. . . . If the need for updating is constant, then the formation must be permanent. This need is not limited to professional formation; it includes religious formation and, in general, the enrichment of the whole person. (Section 68)

The learning of effective stress coping techniques, such as pranayama, can be understood under the banner of formation because pranayama can be pedagogical (Nemati, 2013), can enrich the whole person by relieving stress and its negative consequences, and can even be a tool for religious formation as was seen in the *Philokalia* (Kadloubovsky & Palmer, 1951). Formation includes skill and competency in a wide range of areas, including cultural and psychological fields (Sacred Congregation for Catholic Education, 1982, Section 27), and with yoga becoming part of mainstream culture and with psychologists embracing yoga methods (Hayes & Chase, 2010), the call to formation includes to the call to learn helpful new skills like pranayama.

Church documents on the rights of workers suggested that workers, including principals at Catholic schools, should be able to work without lowering their dignity. Leo XIII (1891) warned that daily labor should be regulated so that the number of hours worked do not extend beyond an individual's strength to manage the job (Section 42). In the same section, Leo XIII (1891) stated that it is right and just to allow the worker to have proper rest of the body and the soul. Similarly, John Paul II (1981) condemned situations in which a worker's dignity is being violated, argued that a people should not experience a lowering of their dignity at work, and cleverly pronounced that work is for man, not the reverse. Considering that in 2006 principals averaged 50 hours per week with an addition eight hours of weekend or evening work, in

contrast to a principal in the 1960s who worked a 40 hour week (Carson, 2010), we as a society must decide whether the job requirements of the principal are violating the admonitions of Church leaders. Indeed, the work of education "requires calm, interior peace, freedom from an excessive amount of work, continuous cultural and religious enrichment" (Sacred Congregation for Catholic Education, 1982, Section 73). Pranayama may produce calm, interior peace, and even religious enrichment, but Catholic schools may want to explore other models of leadership to produce a freedom from excessive amounts of work (e.g., Grubb & Flessa, 2006).

Summary

This review of literature identified the main theories concerning psychological stress, focusing on those theories that attempt to explicate stress in the workplace: the stimulus response theory (Selye, 1976), the appraisal theory (Lazarus, 1966), the homeostasis model (McGrath, 1970), the resources theories of stress (e.g., Hobfoll, 1989; Vaux 1988), the stressful life events method (e.g., Thoits, 1994), the challenge-hindrance model of stress (Cavanaugh, Boswell, Roehling, & Boudreau, 2000), and the job demands-resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). What these models all agree on is that stress, if not contained or managed, can lead to serious physical, psychological, and mental consequences. Gmelch and Swent (1977) first investigated principals and stress, and since that time, their instrument, the Administrator Stress Index, has been used in numerous studies to confirm that in many cases principals are experiencing moderate to high levels of both stress and its consequence: burnout. Gmelch and Swent (1977) also pioneered the work on how principals cope with stress, and subsequent studies have refined their work (Allison, 1997; Gmelch, 1988; Roesch, 1979).

Although coping scales continue to be used in research, there is a push to investigate the quality of coping by collecting narratives.

Yoga, an ancient philosophy and way of life filled with multi-modal psycho-spiritual technologies, has demonstrated its effectiveness in treating both stress and stress related disorders such as depression and anxiety. Research has also shown that pranayama, one of the methods of yoga practice that involves regulated slow breathing, is effective in treating stress, perhaps by means of its down-regulating the HPA-axis and sympathetic nervous system while simultaneously stimulating the parasympathetic nervous system. New stress research has focused on the role that emotions play in both the appraisals of stress and the implementation of coping, and both yoga generally and pranayama specifically may assist in the emotion regulation process.

The Catholic tradition, both in its foundation stories of the gospels and with the practices of its early mystics, has placed an emphasis on the breath as a means to spiritual connectivity, and more recent Church documents have urged educators and principals, as part of their formation process to become integral human beings, to embrace new methods that have been validated by science.

CHAPTER THREE

METHODOLOGY

Restatement of the Purpose

The purpose of the study was to explore the phenomena of principals at Catholic schools who implemented a pranayama practice by investigating these principals' perceptions of its utility as a coping technique, the changes in the principals' perceptions of stress, the themes of their emotional narrative vis-a-vis their perceptions of stress, and any additional stressors that these principals have.

Research Design

The design for this study was a mixed methods design, specifically an embedded mixed methods design, in which both qualitative and quantitative data were collected concurrently with the quantitative data supplementing the qualitative data, which was the bulk of the study. Creswell (2012) highlighted the advantages of this design: "Quantitative data are more effective at recording outcomes of the experiment than identifying through qualitative data how individuals are experiencing the process" (p. 545). Because this study sought both to estimate the outcomes of the pranayama intervention, i.e., did it reduce perceived stress in principals, and to arrive at themes around that experience, the embedded design suited this study best. The quantitative data set was analyzed first and informed the interview questions for the qualitative data.

Tashakkori, Brown, and Borghese (2010) strongly advocated for the use of mixed methods designs in stress research because they produce "more complete and accurate picture" (p. 38) and because they provide "both breadth and depth necessary to understand such a

complex issue" (p. 40). Onwuegbuzie, Johnson, and Collins (2010) also pointed out that a mixed methods approach serves to minimize the weaknesses in one approach (quantitative in this instance) by the strengths of another approach (qualitative). Relationships that emerged in the quantitative portion of the study are explained more deeply in the qualitative portion of the study. The authors also noted that an advantage to the mixed methods approach is that it allows for multiple validities that result in high quality meta-inferences that might have been missed using only one or the other methodology.

The qualitative portion of the research utilized both one-on-one interviews and documents in the form of journals on google sheets. Since the qualitative portion of this study sought to explore how principals experience pranayama as a stress coping intervention, the qualitative portion falls into the realm of phenomenology. The one-on-one interview is "a data collection process in which the researcher asks questions to and records answers from only one participant in the study at a time" (Creswell, 2012, p. 218). In-depth interviews are the primary means of collecting data for a phenomenological study so that the individuals can describe the meaning of their experience (Creswell, 2013). Though the one-on-one interview is the most costly and time consuming method for collecting data and though it requires articulate and candid subjects (Creswell, 2013; Creswell, 2012), it is a great source of phenomenological data. These interviews were transcribed by the researcher and validated by the participants.

Documents "consist of public and private records that qualitative researchers obtain about … participants in a study, and they can include newspapers, minutes of meetings, personal journals, and letters" (Creswell, 2012, p.223). The documents that were used in this study were personal journals recorded in google sheets. Creswell (2012) pointed out the advantages of

journals: participants often give thoughtful attention to them, journals are written in the participants' own words, they do not require transcription, and they are a good source of qualitative data.

The quantitative portion of the study utilized a survey research design, which is used to ascertain the attitudes and characteristics of a sample (Creswell, 2012). Specifically, a web-based questionnaire, which is "a survey instrument for collecting data that is available on the computer" (Creswell, 2012, p. 383), will be employed. In addition to the demographic information collected by the questionnaires, the participants' answers after the intervention were compared to their answers before the intervention to see if there is a change in the perceptions of both stress itself and the sources of stress. Items that indicated either high stress or high sources of stress were identified and incorporated into the interview portion of the research. Thus, the study met the criteria for an embedded design, in which the quantitative data supported the qualitative.

Population and Sample

The population for this study was principals or heads of schools, both of primary and of secondary schools, from dioceses in Northern California, including diocesan and independent Catholic schools. From this population, the researcher recruited eight principals to participate in the study. The sample contained four males, three of whom were elementary school principals and one of whom was a high school principal, and four females, three of whom were elementary school principals and one of whom was a high school principal. One female elementary school teacher dropped out of the study two weeks into the intervention. Creswell (2013) suggested that no more than ten individuals be used for the interviews in phenomenological investigations, and

Dukes (1984) recommended that anywhere from three to ten individuals be studied, provided that each "instantiation" of the experience can make sense of that experience (p. 201). In the event that several individuals dropped out of the study during its course, having a few extra participants was necessary to insure its viability. The researcher used typical sampling, "a form of purposeful sampling in which the researcher studies a person or site that is 'typical' to those unfamiliar with the situation" (Creswell, 2012, p. 208). Emails were sent to the principals requesting participation, and eight principals responded with interest. All participants met eligibility requirements, including proper job title and current employment at a Catholic school.

Instrumentation

Semi-structured interview questions were created. The interview took place after the intervention and after the surveys in order to minimize the effect of qualitative data on the quantitative data (Creswell, 2012, p. 545) and included the following questions:

1) Of those items that you marked highest on the ASI, what is the scope and pervasiveness of these stressors (acute, chronic, large scale) and what are your perceptions of them. (Research Question 1)
2) Can you tell me about any items on the PSS that you marked "very often"? (Research Question 1)
3) What are your experiences with (past history of) stress and coping? (Research Question 1)
4) Tell me about any questions on the ASI that you marked differently? What has changed and why? (Research Question 1)

5) What has been your previous experience with mindfulness, yoga, meditation, or pranayama? (Research Question 2)
6) What was your experience of implementing the pranayama practice? (Research Question 2)
7) What are your attitude and feelings towards the pranayama practice? Tell me about a time when the practice reflected your attitude and feelings. (Research Question 2)
8) Do you intend to continue the pranayama practice now that the intervention is over? Why or why not? (Research Questions 2)
9) Were there any aspects of the practice that were particularly difficult or easy for you (e.g., lengthening inhale, hold after inhale, lengthening exhale, hold after exhale, producing the Ujjayi sound)? (Research Question 2)
10) Would you recommend pranayama to other principals? Why or why not? To students, faculty, or staff? Why or why not? (Research Question 2)
11) What situations in your context have helped you implement the pranayama practice? What situations in your context have hindered you from implementing the pranayama practice? (Research Question 2)
12) Did you use a metronome to help you count? What was your experience of counting the breath? (Research Question 2)
13) Tell me about a particularly stressful situation that happened during the intervention? Did pranayama play a part in the stress coping process (Research Question 2)

14) What differences did you notice about your ability to focus? To what extent did you find yourself thinking about work away from work? (Research Question 2)
15) Tell me about the other coping techniques you use for stress. What do you do when you get stressed? (Research Question 3)
16) How did the pranayama practice compare to your other coping strategies? Did you find yourself using other strategies more or less? (Research Question 3)
17) Tell me about some of the strong emotions that you logged in your journal. (Research Question 4)
18) Tell me about your emotional state before, during, and at the end of the intervention. What changes, if any, did you notice? Were there any stressors whose emotional response changed over the course of the intervention? (Research Question 4).
19) Are there any sources of stress that you experience that are not contained on the ASI (Research Question 5)?
20) Do you feel that there are any stressors that are unique to principals at Catholic schools versus public school principals? Explain. (Research Question 5)

The interviews took place in the office of the principals or at a coffee shop, in the case of one principal, because the principal preferred to meet there.

The Administrator Stress Index

Gmelch & Swent (1977) developed the Administrator Stress Index (ASI) (as reported in Gmelch & Swent, 1984). It consists of 35 questions pertaining to the potential sources of stress that an administrator might experience. The test uses a 5-item Likert scale with an option to

circle NA (Not Applicable). The survey asks, "How often are you bothered by each of the situations below?" (Shumate, 1999, p. 140). Choice one on the scale is identified by "rarely or never bothers me," choice three by "occasionally bothers me," and choice 5 by "frequently bothers me." By 1993 the ASI was used in over 50 studies (Gmelch & Torelli, 1993). Gmelch and Torelli (1993) reported that the original reliability was established using factor analysis with eigenvalues of .30 (loading criterion) or higher, and while their study used the higher criterion of .40, they still found that all 29 questions from task-based, boundary-spanning, and role-based stress had loadings from .80 to .40. They also added 4 questions into conflict-mediating stress, questions which also met this criterion.

The current version of the test now has 35 questions and was used in three ways. First, the total score from the initial testing was compared to the total score from the final testing for each participant to see if there was a change after one month of pranayama practice (Research Question 1). Secondly, Gmelch & Torelli (1993) categorized the four levels of self-perceived stress in the ASI, and any category that changes by more than 10% will be the subject of a follow-up question (Research Question 1):

1. Boundary-spanning stress factor used *ASI* items 15, 17, 21, 24, 27, 29, 35 *(n* = 7) to measure this stress type with a possible scoring of 1-35. A score change of four triggered a follow-up question.

2. Conflict-mediating stress factor used *ASI* items 7, 13, 20, 23 and 33 *(n* = 5) to measure this stress type with a possible scoring of 1-25. A score change of three triggered a follow-up question.

3. Role-based stress factor used *ASI* items 3, 4, 5, 6, 8, 11, 16, 19, 22, 28, 30, and 34 *(n* = 12) with a possible scoring of 1-60. A score change of six triggered a follow-up question.

4. Task-based stress factor used *ASI* items 1, 2, 9, 10, 12, 14, 18, 25, 26, 31, and 32 *(n* = 11) with a possible scoring of 1-55. A score change of six triggered a follow-up question.

Finally, the change in ASI score for all participants was correlated with the total number of breathing minutes and the average number of breathing minutes for these participants. The change in individual stress factors (BS, CM, RB, TB) was also correlated with the total number of breathing minutes and the average number of breathing minutes (Research Question 1).

The Perceived Stress Scale

The Perceived Stress Scale (PSS) is the most widely used measure of perceived stress, especially stress that has taken place in the last month (Sharma et al., 2013). It consists of 10 questions and a five-point Likert scale from 0 to 4, with 0 being "Never," 1 "Almost Never," 2 "Sometimes," 3 "Fairly Often," and 4 "Very Often." Designed to measure how individuals appraise situations as stressful, it was validated with three samples, two groups of college students and one group in smoking cessation program (Cohen, Kamarck, & Mermelstein, 1983), and the authors reported evidence for both concurrent and predictive validity as well as adequate internal and test-retest reliability. The authors discovered that neither sex nor age affected validity criteria and suggested that a one or two month period be used for the test to ensure higher predictive validity (Cohen, Kamarck, & Mermelstein, 1983).

The total score from the initial testing was compared to the total score from the final testing for each participant to see if there was a change in perceived stress after one month of pranayama practice (Research Question 1), and each question's initial score was compared to its

final score (Research Question 1). Also, the change in PSS score for all participants was correlated with the total number of breathing minutes and the average number of breathing minutes for these participants (Research Question 1).

Data Collection

Catholic schools in the San Francisco Bay Area were contacted by email explaining the intent and process of the proposed research, and principals who expressed interest were contacted by a follow-up email. Written consent was obtained from the principals who chose to participate, the surveys were administered online via google forms, and times and places to administer the interview were negotiated individually. Preferred methods for follow-up communication with each principal were ascertained, and then each one was contacted bi-weekly to ascertain progress and answer questions about process. Principals took the ASI and the PSS two times, once at the start of the research and once at the end of the intervention. After the one month intervention, the researcher had a post-intervention semi-structured interview with each principal.

The intervention took place over one month (or four weeks), and the principals were asked to practice pranayama four times per day for the entire month for eight minutes per session. A one month pranayama intervention is sufficient to produce significant results (e.g., Sharma, Azmi, & Settiwar, 1991;Vedamurthachar, Damodaran, Lakshmanan, & Kochupilla, 2013), and other researchers have designed successful interventions with 30 minutes of pranayama practice per day (Sharma, Rajajeyakumar, et al., 2014; Sharma, Trakroo, et al., 2013). Five minutes of practice has shown significantly reduce blood pressure and heart rate (Sharma, Rajajeyakumar, et al., 2014). Although there are precedents for longer interventions, the

researcher wanted to minimize the disruption that this intervention may cause to principals who may be stressed because of being too busy.

After receiving consent from the Institutional Review Board at the University of San Francisco, this researcher developed a survey to collect the needed data. The survey collected demographic data of the administrators, including the gender, marital status, age, highest level of education, and faith, as well as information about the size and the operation of the school. Survey questions also included questions from the Perceived Stress Scale (PSS) (Cohen, 1988; Cohen, Kamarck, & Mermelstein, 1983) and from the Administrative Stress Index (ASI) (Gmelch & Swent, 1977). The survey lasted no more than 15 minutes.

The researcher met with each participant for 20 to 30 minutes before the start of the intervention at the participants' offices, save for one principal who met at a coffee shop. After exchanging pleasantries, the researcher explained that pranayama was part of the yoga tradition and that it was an effective stress-reducer in other experimental contexts. The researcher taught a basic Ujjayi pranayama technique to the participants by demonstrating first how to make the Ujjayi sound and having the participant mimic the researcher. Once the participant was able to produce the sound to the researcher's satisfaction, the researcher explained that an equal inhale-exhale breath ratio was optimal for the intervention and that holds between inhale and exhale of a few seconds, or at most half the length of the inhale and exhale, could be done if the participant felt comfortable holding the breath. The researcher suggested that the participants could slow the breath down even more, only if they could keep the breath smooth and uninterrupted. The participants were instructed to sit upright with their palms on their thighs, palms facing up. They were asked to keep their eyes closed. The researcher then practiced

breathing Ujjayi pranayama with the participant for a few minutes using his own metronome application on his smartphone to help the participant count. The pranayama was done through both nostrils with a slight glottal contraction at the back of the throat. The participants were not taught to expand or contract the chest or belly because the emphasis was on the slowness of the breath.

Next, the researcher answered any questions that the participants had about the process. Participants were then advised to use a metronome application on their smartphone to help them count the breath (e.g., Tempo). Participants were asked to perform eight minutes of breathing four times each day, once in the morning before going to work and before breakfast, once before lunch, once before dinner, and once before bed, because as little as five minutes of breathing appears to be sufficient to produce a parasympathetic nudge (Bhavanani, Sanjay, & Madanmohan, 2011). Desikachar and Krishnamacharya (1998) also recommended that pranayama be practiced before food or six hours after food, so this regimen roughly meets those requirements. Participants were also encouraged to breathe additional times in the day should they feel that the need arises.

Next, using his own computer with a preloaded google sheet, the researcher taught the participants how to record their breathing practices using a shorthand of inhale:hold:exhale:hold, e.g., 6:2:6:2 indicated an inhale of six seconds, a hold of two seconds after inhale, an exhale of six seconds, and a hold of two seconds after exhale. Participants were asked to keep a daily record of their pranayama practice on this google sheet that included the date of the practice, the number of minutes of each pranayama practice, the average breathing ratio that they used for the day, any strong emotions that they experienced, any other coping techniques they employed, and

any notes on the experience. The prompt for the different fields was: "Minutes Pranayama," "Breathing ratio," "Biggest stressor," "Any strong emotions associated with biggest stressor," "Other coping strategies used," and "Notes on pranayama experience/addition practice."

Data Analysis

After the intervention, the PSS and ASI data were analyzed by hand to see if totals moved for each individual and to see which answers have changed. Journal data was analyzed and coded for themes. Then, the semi-structured interviews took place, with the interview protocol being informed by the analysis of the PSS, ASI, and the journals. The semi-structured interviews were transcribed and coded, and transcripts were sent to principals so that they can validate the spoken data, shared via google docs. No participant indicated any changes to the transcripts. The transcriptions of the interviews were collated into a single folder entitled "Transcripts from Roos Dissertation," with each interview being in its own google document in that folder. For citation purposes, all the transcripts were copied into a single google doc called "All Transcripts" stored in the same folder. Hard copies are stored in a secure location in the researcher's home and will be kept there for seven years after the research has taken place, and electronic versions will be kept in the researcher's google drive which is password protected. The pranayama journals will also be stored in the researcher's google drive for seven years after the completion of the study. Interview audio data will be stored on the researcher's phone and computer, both of which are password protected. In writing up the research, the researcher used pseudonyms for the participants and did not identify the schools at which the principals worked. The principals who participated were thanked by email and verbally in person.

The PSS, ASI, and the coding of interview questions 1-4 were used to answer Research Question 1: To what extent is there a change in perceived stress after the pranayama intervention? The coding of interview questions 5-14 and the coding of the journals were used to answer Research Question 2: What was the experience of the pranayama practice for Catholic school principals? The coding of interview questions 15-16 and the coding of journals were used to answer Research Question 3: What other coping techniques do principals at Catholic schools use and how do the principals compare the effectiveness of the pranayama practice to their other coping techniques? The coding of interview questions 17-18 and the coding of journals were used to answer Research Question 4: What narratives are the principals able to tell about their emotions during the intervention? Is their emotional state different after the intervention? To what extent does pranayama help with emotion focused coping and emotion regulation? The coding of interview questions 19-20 and the coding of journals were used to answer Research Question 5: To what extent are there additional sources of stress for principals at Catholic schools? See Table 8 below for a summary of research questions and data used.

Table 8: Research Questions and the Sources of Data for their Answers

Research Question	Data Used
1. To what extent is there a change in perceived stress after the pranayama intervention?	Analysis of the PSS, analysis of the ASI, and the coding of interview questions 1-4
2. What was the experience of the pranayama practice for Catholic school principals?	The coding of interview questions 5-14 and the coding of the journals
3. What other coping techniques do principals at Catholic schools use and how do the principals compare the effectiveness of the pranayama practice to their other coping techniques?	The coding of interview questions 15-16 and the coding of journals
4. What narratives are the principals able to tell about their emotions during the intervention? Is their emotional state different after the intervention?	The coding of interview questions 17-18 and the coding of journals

5. To what extent are there additional sources of stress for principals at Catholic schools?	The coding of interview questions 19-20 and the coding of journals

Reliability and Validity

Bogden and Biklen (2007) concluded that the quantitative concept of reliability, namely the expectation that "there will be consistency in results of observations by different researchers or by the same researcher over time" (p. 39), does not apply to qualitative research. Instead, they defined reliability as the match between the data and what actually happens and suggested that two researchers studying the same phenomenon might produce two different sets of data with different conclusions and still have reliable studies. Creswell (2013) defined validation in qualitative research "to be an attempt to assess the 'accuracy' of the findings, as best described by the researcher and the participants" (pp. 249-250). Creswell (2013) proposed that the following strategies be implemented in order to provide reasonable validation in qualitative studies: 1) prolonged engagement with the participants, 2) triangulation of data, 3) peer review, 4) negative case analysis, and the 5) clarification of researcher bias. In order to validate this study, the researcher will 1) spend as much time with the participants as is reasonable and make himself available to the participants via phone, email, and text, 2) use the triangulation of interview data with data collected from the participant journals, 3) consult with his committee members who will check the researcher's interpretations and methods, 4) report data that does not confirm the evidence, and 5) clearly report the researcher's own bias towards the effectiveness of pranayama as a stress coping tool.

Ethical Considerations

This researcher sought and obtained the consent of the Institutional Review Board at the University of San Francisco before undertaking the project. He also took precautions to insure the confidentiality of the principals who volunteer to participate in the study. Furthermore, the researcher administered the survey and interviews in such a way as to cause as little disruption as possible to lives of the principals. Participants were informed about the nature and purpose of the study, their confidentiality, and their right to withdraw from the study.

Background of the Researcher

The researcher currently works as a Latin teacher, A Cappella teacher, Meditation Club moderator, and Cross Country & Track coach in an urban Catholic high school in northern California. Prior to these jobs, he has also worked as an English teacher, History teacher, department head, and student activities director. He is currently in his ninth year at the school. He also serves on two non-profit boards and works several times a year as a yoga teacher for yoga teachers-in-training.

He was raised in New Orleans, attended Jesuit High School there, and earned his B.A. from Stanford University in an individually designed major called Classical Dramatic Studies. After college, he worked in Los Angeles at his own tutoring company for six years and then moved to Albuquerque to study yoga and Ayurveda. After traveling around the world studying the Vedic mystic sciences and brief stints in both New Orleans and Marin, he attended San Francisco State University for his M.A. in Classical Philology (Classics) and is currently attending the University of San Francisco, pursuing his doctorate in Catholic Educational

Leadership. He also maintains a fairly regular pranayama and meditation practice and is currently studying tai chi and qi gong in San Francisco.

In the next chapter, the researcher has shared the experiences of the principals who participated in this study, using their own words as much as possible. Their voices demonstrate the benefits of the pranayama practice and the high levels of stress that our principals are experiencing, particularly from having a prodigious number of tasks to complete.

CHAPTER FOUR

FINDINGS

Research Questions

The findings are organized by the research questions of the current study. Each question was answered using interview data obtained from the participants and supported by the journal entries of the participants, when available. Some principals did not feel able to complete the journals because they felt too busy, and subsequently, journal data is sometimes sparse and often incomplete. Question number one was also answered using the results of the two surveys that the principals completed. All interview transcripts were copied into a single google doc called "All Transcripts," and that document was used for citation of the interviews.

Research Question 1

To what extent is there a change in perceived stress after the pranayama intervention?

The following results were obtained for each principal using the ASI, the PSS, and data from interviews and journals. Because of the mixed methods used to answer this question, the section will be organized by sections on each principal, with a discussion starting from that principal's stress to his or her perceived efficacy of the intervention. For the purpose of discussion and comparison, I have divided the possible average range into quintiles and have labeled these average scores on the ASI from 0-.99 as unstressed, 1.00-1.99 as low perceived stress, 2.0 - 2.9 as moderate perceived stress, and 3.0-3.9 high perceived stress, and 4.0-5.0 as very high perceived stress. Similarly, I have labeled scores on the PSS from 0-7 as unstressed, from 8-15 as low perceived stress, from 16-23 as moderate perceived stress, from 24 to 31 as

high perceived stress, and from 32-40 as very high perceived stress. The following table shows the quintiles for both tests and the descriptors therein.

Table 9: ASI and PSS Quintiles with Descriptors

ASI	PSS	Perceived Stress
0.00-0.99	0-7	Unstressed
1.00-1.99	8-15	Low Stress
2.00-2.99	16-23	Moderate Stress
3.00-3.99	24-31	High Stress
4.00-5.00	32-40	Very High Stress

Principal 1

Wayne Carver, in his early 60s, is the principal at a Catholic elementary school with circa 250 students, 33 faculty and staff, and one assistant principal. He is married, holds an advanced degree, identifies as Catholic, and has been a principal for 15 years. He took the first round of surveys on April 16, 2016 and the second on May 18, 2016, and he performed the intervention from April 19 to May 19 of the same year.

Table 10: Principal 1 Survey Results and Breathing Log Data

ASI Average Survey 1	3.05 High Stress
ASI Average Survey 2	2.86 Moderate Stress
Average ASI Change	**-0.19**
Change in	
Task Based Stress	-1
Role Based Stress	-5
Boundary Spanning Stress	+2
Conflict Mediating Stress	-3

PSS Score Survey 1	21 Moderate Stress
PSS Score Survey 2	12 Low Stress
PSS Change	**-9**
Recorded Minutes of Breathing	984
Average Minutes Breathing per Day	31.7
Most Common Breath Ratio	6:2:6:2

Of all the principals in the study, Wayne was the most successful at both keeping accurate journal entries and breathing at the appropriate times and for the suggested lengths of time. He had a modest reduction of perceived stress as indicated on the ASI (-.19) but a rather dramatic reduction in stress as indicated on the PSS (-9). Role based stress and conflict mediating based stress were both reduced by more than 10%, triggering follow-up questions in the interview.

Wayne's response to stress was anxiety and its derivatives worry and concern. He mentioned anxiety 12 times in his journal, concern seven times, and worry five times. In the interview, Wayne described his anxiety as produced from a confluence of tasked-based stressors, "I wouldn't say that it's chronic, that it's all the time, but I would say when you have various factors that come together at the same time, extensive evening meetings, less sleep, then things can be very anxious" (Roos, 2016, p. 13). Some of the biggest stressors from his journal included faculty meetings, handbook revisions, participating on a union grievance panel, a school audit, preparing for a principals' meeting, car issues, attending a track meet, tuition issues with parents, staff-parent conflict, and evening meetings. Other stressors mentioned in the interview included finances, enrollment, budgeting, making budget cuts, repurposing teacher

roles, working 14-15 hours per day, with so much anxiety that he reported waking up at 3:00am thinking about his to-do list. Demographic changes that resulted in decreased enrollments created more responsibility in the areas of fundraising and marketing. He noted that in the last seven years, he's more involved with curriculum, including common core and ELA core, and child safety measures required by the diocese. Concerning his high expectations for himself and his employees, Wayne said:

> Sometimes it involves a little bit more than that, you know, if they[faculty and staff] are not meeting the expectations, then I gotta follow up on that, but I have very high expectations of what I do and how I operate so...along with that brings anxiety when I'm not performing to the best of my ability. (Roos, 2016, p. 14)

Wayne linked his anxiety to his high expectations for himself and his staff. For Wayne, finances became more stressful because decisions that he made increased the number of tasks that he was responsible for:

> A couple of years ago, because of finances, I took away my janitorial position. I had a full time janitor. I took it away because I wanted to utilize that money for my reading specialists of about fifty grand or more a year. So, I had to pick up, you know, the setup work in the morning, during lunch: setup work, any kind of maintenance, you know, kids throwing up, issues with staff, what have you, so, but those are the expectations I put on myself. (Roos, 2016, p.14)

Indeed, he cut the budget for the janitor so that he could have a reading specialist, so all the janitorial work fell onto him. He linked this decision to his high expectations as well.

The large number of meetings were also stressors: parish council, advisory board, athletic board, parent meetings, and faculty meetings. Wayne tried to run his own meetings efficiently, but "if I have a lot of meetings going on, I just get stressed out, and, you know, it's the end of the day, and, man, I could lick my nose off the carpet at the end of the meeting, kind of thing" (Roos, 2016, p. 15).

Even though Wayne described the end of the year as the most stressful part of the year, he found the breathing intervention useful in helping to cope with his stress: "it came at a good time because I was dealing with all this stress. So, to me, the discipline and the breathing and doing it, I think rather accurately, to the best of our ability, proved worthwhile" (Roos, 2016, p.16). The intervention carved out down-time in Wayne's day that allowed him much needed space from his high number of tasks:

> To me, it's worked. It was a very relaxing time and to be honest with you, I didn't always take that time during the course of the day to do that, you know, in the way--I mean, I did in the way that I took the quiet time to go for a walk, but a disciplined way for breathing: I didn't do it. So, it was good timing. (Roos, 2016, p. 16)

For Wayne, the commitment he made to do this study afforded him the discipline he needed to take a break in the workday and relax in a way that he was unable to do before the intervention. Relaxation was not the only benefit for Wayne:

> I just found it gave me a certain detachment to really step away for a little bit and really reflect on some things I needed to deal with. Um, the other thing is, this year was a particularly tough year because we had our self study…. it was really extensive and towards the end of the year, along with the breathing exercise I was able to make that a little easier and it just seemed to come a little easier, you know, when, because when you're relaxed you tend to express yourself a little bit more thoroughly, with a little bit more lucidity, you're not as rushed, you're not really running for one thing, you pause a little bit more…. So with the breathing exercise it's that, it kind of, it gave me a better sense of my pace. (Roos, 2016, p. 17)

For Wayne both the capacity for reflection and the more fluent communication were ancillary benefits that manifested as a result of the breathing. The self-study that he mentioned also became easier for him, and he described increased clarity, a better ability to pause, and a new sense of pacing with the many tasks he had to do in a day.

The breathing also had a positive effect on Wayne's perceptions of conflict-mediating stress. Not only did his conflict mediation stress score on the ASI decrease by three, but he also had this to say:

> It gave me a better sense of groundedness when I'm at meetings and even high-tense meetings. I know when I first started doing this I had a real, heavy parent issue that just needed to be resolved--a high-level parent meeting with a parent that was just doing some really difficult things and creating a real hostile environment within the community and, uh, I had to call her on it, and it was really, really difficult, bringing stuff to the downtown, bringing stuff to the pastor, and financing, and you know we're dealing with this and you know that meant really, very anxious meetings, collectively, and then dealing with stuff that was, uh, you know, quite stressful and I found that the breathing helped. (Roos, 2016, p. 17)

Wayne described a groundedness that results from the breathing that allowed him to better navigate the stress from high anxiety meetings with difficult parents and other constituencies.

Even though Wayne's score for role-based stress on the ASI went down by five points, Wayne did not see the breathing as directly impacting stress from role, only indirectly so:

> I don't think it lessened in my stress that I feel in the role that I have, I think it's still there, whether it's department of Catholic schools, whether it's my pastor, whether it's, uh, high level staff people. The expectation is still there, but I think my ability to respond to those various people, I think I, uh, have a better sense of approach to it, it's not as stressful, I think I'm not as anxious, I think I'm clearer on what, on how to approach things, and, uh, I think it's a direct result of being more relaxed. (Roos, 2016, p. 17)

For Wayne, being relaxed from breathing allowed him to approach his superiors in a less stressful and less anxious way, even though the stress from dealing with those individuals is still present.

Finally, Wayne felt that the breathing had a positive impact on his leadership, specifically his tone and his approach in managing others: "I think the breathing has settled my tone and approach a little bit more. And I think generally I have a pretty good tone, but I think it made it a little bit more better. Seems to show it" (Roos, 2016, p. 18). With a better tone and approach,

Wayne feels that the breathing has helped his collegiality and his professionalism in his leadership role.

Summary of Principal 1

With a confluence of both quantitative and qualitative results, Wayne had a large reduction of perceived stress as a result of the pranayama practice, going from high stress to moderate stress on the ASI and from moderate stress to low stress on the PSS. His quantitative results of -.19 on the ASI and -9 on the PSS corroborated his narrative description of better pacing, increased relaxation, increased capacity for reflection, more fluent communication, better interaction with his superiors, better tone and approach, and self-reported decrease in anxiety. He took the second set of surveys before the school year had ended, a stressful time according to Wayne, and his results must be interpreted as noteworthy because his perceived stress decreased at that stressful time.

Principal 2

Margaret Skeeter is the principal at a Catholic elementary school with circa 300 students, 23 faculty and staff, and one assistant principal. She is single in her mid sixties, holds a masters degree, identifies as Catholic, and has been a principal for 28 years. She took the first round of surveys on April 10, 2016 and the second on May 19, 2016, and she performed the intervention from April 18 to May 17 of the same year. .

Table 11: Principal 2 Survey Results and Breathing Log Data

ASI Average Survey 1	2.37 Moderate Stress
ASI Average Survey 2	2.48 Moderate Stress
Average ASI Change	**+0.11**

Change in	
Task Based Stress	+6
Role Based Stress	-2
Boundary Spanning Stress	+1
Conflict Mediating Stress	-1
PSS Score Survey 1	10 Low Stress
PSS Score Survey 2	10 Low Stress
PSS Change	**0**
Recorded Minutes of Breathing	814
Average Minutes Breathing per Day	27.1
Most Common Breath Ratio	6:0:6:0

Margaret kept an accurate journal with regards to recording the breathing ratio and the numbers of minutes of breathing. She had a modest gain in perceived stress as indicated on the ASI (+.11) but no change in perceived stress levels as indicated by the PSS. However, a score of 10 on the PSS is a low score indicating relatively little perceived stress. Task-based stress was increased by more than 10%, triggering follow-up questions in the interview.

Indeed, in addition to a low score on the PSS, Margaret reported not having all that much stress at her job, cognitively reframing her experience by stating that other professions have more stressful jobs: “People have much harder, much higher stressors than these. They’re just kind of the constant sit-go with this job and with this time of the year, I think.” (Roos, 2016, p. 67). She also claimed that she does not think about stress very often and just “roll[s] with it

when it happens" (Roos, 2016, p. 67). Part of her reasoning for experiencing so little stress on the job is her experience at the job:

> Yeah, I guess I don't really feel much pressure when performing, because I think I'm, I do, and I, I mean, I do perform well on what I do. I've been at it for so long. I don't mean to sound condescending or arrogant at all. Or maybe just 'cause I know how hard I work and that's why I do perform my job. (Roos, 2016, p. 68)

Her self-assurance in her performance ability acts as a shield against feeling the pressure from stress. Her journal included the following as some of her other stressors as well as the frequency of those stressors: none, seven times; parent issues, three times; being short staffed, three times; workload, two times; conflicts, three times; preparing for meetings or events, two times; remembering to do the intervention, one time; and a public speaking event, one time.

Her tasked-based stress did increase over the course of the intervention, and when I asked her about some particulars, she responded with some end-of-the-year frustrations:

> Probably because I was having to do so many more things at this time of the year, and nobody seemed to pay attention to anything, no one knows what's going on, and I'd send things out two times, three times, I'm probably just frustrated by it. (Roos, 2016, p. 68)

Both an increased number of tasks and a lack of attention to her attempts to communicate were sources of frustration for Margaret. The end of the year also has two additional stressors for Margaret: "Everyone who has sat on their concerns all year decides to come to school and share them with you" (Roos, 2016, p. 69) and "you're busy to begin with and then everyone has to give you their opinion" (Roos, 2016, p. 69). Listening to concerns and hearing people's opinions when Margaret was busy at the end of the year was stressful, and Margaret outlined some of the tasks associated with this time period to include teacher evaluations, teacher contracts, hiring, letters of recommendation, bills, and lesson plans on Monday.

Unfortunately, Margaret found that the breathing intervention was an additional source of stress amidst her busy day:

> M: I think it, I think part of the, some of the breathing caused stress.
>
> S: Some of the breathing caused stress?
>
> M: Yeah, like those eight minutes all of a sudden, I was like ah, I didn't do it, I got to do it now.
>
> S: Okay, so you were having stress in a situation, oh I committed to this, I need to do it.
>
> M: Right, exactly.
>
> S: Okay. And, after breathing, did you feel better, or …
>
> M: Sometimes. Not necessarily. Well I didn't really think too much about it, I just got right back into what I was doing. Like, the middle of the day one was just really hard. (Roos, 2016, 69-70)

Margaret was unaware of any benefit to a pranayama practice of eight minutes in length scheduled into the middle of the day, and in the context of the many things that she had to accomplish, a fixed breathing regime became an additional task-based stressor. However, if Margaret thought a stressful situation was approaching, she would practice some untimed pranayama before that situation: "I think when I was doing the breathing intervention sometimes, even if stress was coming up, I would do some breathing. I wouldn't do eight minutes, but, and it seemed to be calming" (Roos, 2016, p. 67). For Margaret the value of the pranayama was not in regular practice but in preparing for a particularly stressful situation.

Summary of Principal 2

Margaret's ASI score increased .11 and her PSS score remained unchanged, and she remained in the same quintiles for both tests--moderate stress on the ASI and low stress on the

PSS. Her PSS score of 10 was rather low to begin with, indicating very little perceived stress at both times the survey was administered, with the second time being at the end of the year--a slightly more stressful time for Margaret. She did not perceive a benefit from a structured pranayama practice; indeed, it added to her stress during the day. She did find pranayama calming before a situation that she perceived to be stressful. Margaret received only a small perceived benefit in stress reduction from the pranayama practice, that of acute stress reduction before difficult meetings.

Principal 3

Antonio Hernandez is the principal at an all-boys Catholic elementary school with circa 350 students, 60 faculty and staff, and two assistant principals. He is married in his mid-forties, holds a masters degree, identifies as Catholic, and has been a principal for 12 years. He took the first round of surveys on March 22, 2016 and the second on May 12, 2016, and he performed the intervention from April 18 to May 17 of the same year. .

Table 12: Principal 3 Survey Results and Breathing Log Data

ASI Average Survey 1	1.37 Low Stress
ASI Average Survey 2	1.69 Low Stress
Average ASI Change	**+0.31**
Change in	
Task Based Stress	+5
Role Based Stress	+3
Boundary Spanning Stress	+1
Conflict Mediating Stress	+2

PSS Score Survey 1	12 Low Stress
PSS Score Survey 2	10 Low Stress
PSS Change	**-2**
Recorded Minutes of Breathing	422
Average Minutes Breathing per Day	14.1
Most Common Breath Ratio	6:2:6:2

Antonio also kept an accurate journal with regards to recording the breathing ratio and the numbers of minutes of breathing, but only recorded entries for biggest stressor on six occasions. He had four days of no breathing at all, three days of breathing only once a day, and 13 days when he was able to breath twice in day. He had a large gain in perceived stress as indicated on the ASI (+.31) and a slight reduction in perceived stress levels as indicated by the PSS (-2). However, an initial score of 12 on the PSS is a low score indicating relatively little perceived stress. Task-based stress was increased by more than 10%, triggering a follow-up question in the interview.

Antonio attributed his low stress scores to two factors: "Overall I'm a pretty optimistic person, and I feel somewhat in control of my life, and I feel like the decisions I make are in my control" (Roos, 2016, p.42). His admission evokes the key resource model of stress, specifically the key resource of optimism (Scheier & Carver, 1993). Generally, Antonio felt that he currently does well and has done well with daily stress. He confessed that his biggest stressors come from significant occurrences that happen outside of the school day:

> I think the part where I particularly struggle is when it's a significant event happening. So I remember the times when I've felt like I've had anxiety attacks have been, you know, when I'm under a lot of stress like my mother is sick and dealing with her hospital care, or the idea of her dying, just, that, that caused a lot of stress I felt like, you know,

> it's hard to manage it. And then another time I .. similar to where you're at now, finishing my master's degree, and you know, working long hours, not getting a lot of sleep, being sleep deprived, and it all of sudden just crashing on me, just feeling another time of … so but aside from those specific incidents, like I overall manage my stress, the day in and day out kind of stuff, relatively well. (Roos, 2016, pp. 42-43)

Both the struggle with the death of his mother, a significant emotional event, and the time and energy required to finish a degree, adding to task-based stress, fuelled significant perceived stress in Antonio's life. Otherwise, he felt like he managed his stress well and felt confident about his ability to handle his personal problems.

Antonio delineated the stress from emails, letters, and memos and the stress from meetings taking up too much time as chronic: 'That's just the nature of the j[ob]--that's just a lot of communication, so I don't, I don't anticipate that that would ever go away necessarily" (Roos, 2016, p. 42). Student discipline problems also created stress for Antonio, but he described that stressor as occurring only at certain times of the year, with the end of the year being fertile ground for student discipline infractions:

> Almost everything gets an extra notch up in terms of the amount of stress just because there's more of it. It's cumulative. Everything kind of, if you have less time to deal with uh, you know, you're dealing with more discipline problems, it means you have less time to deal with paperwork and emails and that adds another level of stress, so I think that's where this [increase in task-based stress] is coming from. (Roos, 2016, p. 45)

Student discipline problems are not necessarily stressful in and of themselves for Antonio; they are stressful because they take time away from all the other tasks that he has to accomplish.

Of the six entries that he recorded as his biggest stressors of the day, three had to do with this study: struggling with identifying stressors, finding the time to meditate, and struggling to get four breathing sessions in. The other three entries were being groggy from a night out,

meeting the parents of a suspended student, and the thought of returning back to work after a holiday.

Antonio was fairly good about breathing in the morning and in the evening, but he had some difficulty with finding the time to breathe in the middle of the day:

> I discovered that during the middle of my day, I really need to take eight minutes to do this, I struggled with that. I was much better about doing this in the beginning of the day, in the morning, doing it at the end of the day. Probably my data reflects that, like that was easy. It was just finding the time. I just, so, and for that reason I don't think I was able to really build a true practice where in times of stress I would revert back to using it, but I think it's helpful. (Roos, 2016, p. 43)

His biggest obstacle to the practice was finding the time in the middle of the day. In responding to the question about the extent to which his stress levels changed over the course of the intervention, Antonio stated:

> Yeah, so I'd say, you know, it's hard to, I think, quantify. I wouldn't say that I all of sudden had this "aha" moment or this feeling like, but I will say that I enjoyed the exercises and I could see how they would be helpful. I think the challenge I faced was creating enough regularity with them to really feel like it's a true practice. (Roos, 2016, p. 43)

Indeed, his biggest obstacle was regularity, and he had an intellectual understanding that the breathing was helpful and a sense that it was enjoyable, but there was not a strong or palpable recognition that the breathing impacted his perceived stress levels. Much like Margaret, he adapted the breathing. In his journal, he recorded on his third day: "I'm starting to take short (2-3 minute) deep breathing sessions much more regularly than I have before." When I asked him about this, he explained:

> Yeah, so I think it was always on the back of my mind, I was like, I want to do this, more even to just fulfill my obligations and say hey, I said I was going to try to do it, … and you know, you need some good data, and I just felt a little bit guilty, like I hadn't been good at it. So if I did have … oh, I don't have anything to do right now, okay, let me just use that as some time, and I can take at least two to three minutes. So it was always on

> the back of my mind, and it was literally just most of those other days when I didn't, I just couldn't find the time. (Roos, 2016, p. 43)

Antonio seemed to be operating from a place of guilt or obligation in adapting the practice to shorter and impromptu sessions, not in anticipation for a stressful event in the near future or an internal desire to mitigate stress.

Summary of Principal 3

Antonio's quantitative results were mixed. Antonio increased his score on the ASI by .31, perhaps because he took the second survey at the end of the year, which held more stress for him, but his PSS score of 12, already a very low score, decreased by 2 points to 10. He remained in the same quintile for both tests, and all four results were low perceived stress. His final ASI score of 1.69, despite the increase, was still a score indicative of very little stress; it was the lowest score of any of the other principals surveyed. Antonio's interview confirmed the idea that he experienced very little perceived stress from work, with his biggest stressors being personal and outside of the work environment. The pranayama intervention became an additional source of task-based stress for Antonio. Although he felt that the pranayama practice was enjoyable and even helpful, it was not apparent that the breathwork impacted his perceptions of stress in any noteworthy way.

Principal 4

Andrew Oltranti is the principal at a coed Catholic elementary school with circa 120 students, 20 faculty and staff, and two assistant principals. He is married in his mid thirties, holds a bachelor's degree, identifies as Catholic, and has been a principal for five years. He took the first round of surveys on April 15, 2016 and the second on May 22, 2016, and he

performed the intervention from April 19 to May 20 of the same year. He did not record any data for April 23 and 24.

Table 13: Principal 4 Survey Results and Breathing Log Data

ASI Average Survey 1	2.26 Moderate Stress
ASI Average Survey 2	2.06 Moderate Stress
Average ASI Change	**-0.20**
Change in	
Task Based Stress	+0
Role Based Stress	-6
Boundary Spanning Stress	-1
Conflict Mediating Stress	+1
PSS Score Survey 1	25 High Stress
PSS Score Survey 2	15 Low Stress
PSS Change	**-10**
Recorded Minutes of Breathing	672
Average Minutes Breathing per Day	21
Most Common Breath Ratio	6:2:6:2

Andrew also kept an accurate journal with regards to recording the breathing ratio and the numbers of minutes of breathing, but only recorded entries for biggest stressor about half the time. He was able to do the breathing intervention three times per day for most days, four times per day on three occasion, and two times per day on four occasions. He had a decrease in perceived stress as indicated on the ASI (-.20) and a large reduction in perceived stress levels as

indicated by the PSS (-10). An initial score of 25 on the PSS is a normal score, and a 15 as a final score indicates relatively little perceived stress. Role-based stress was decreased by more than 10%, triggering a follow-up question in the interview.

Andrew expressed that he wished he could reduce his high expectations on himself. His desire to be a better leader and exceed the expectations of others created some stress:

> I think most people that want to be better educators or better leaders are always trying to, like, push themselves being in a role, you know, like, as a principal and knowing that other people have certain expectations of you and you have your own expectations, so it's, I try to meet their expectations and then take it to another level, I guess is kind of how I, how I, that's how I've operated. (Roos, 2016, p. 27)

Despite compliments and reassurances from his staff on his good job performance, Andrew still experienced stress from the desire to push himself to exceed the expectations of others. Another self-expectation that Andrew put on himself was the desire for students, families, and teachers to feel supported by him, especially at the end of the year because he wanted people to have a good attitude towards the school when they left for the summer. He prioritized their needs as his own:

> One of my duties is to make sure that people feel supported and so sometimes that does come at the expense of like, my own, you know, to-do list, and so then I find myself saying, Alright, well, I got some time after my kids go to bed at home, and if my wife's got some work, you know, she's a teacher as well, so she's got some grading to do then I'll, I'll get online, you know, between eight and 10 and, you know, or I'll wake up before my family's awake, and I'll work from like four to six in the morning, you know, like quiet, uninterrupted time. (Roos, 2016, p.28)

His desire for people to feel supported motivated him to sideline his own tasks so that he could be present for them, but he had to budget late night or early morning times to complete his own work.

Andrew related other aspects of his task-based stress. His school operates longer than most with extended school day from 8am to 5pm, yet he could not find the time to finish his

tasks because his tasks include building a strong community: "Connecting with the families, connecting with the students, connecting with the graduates, it's just that, that whole nature of what we do here" (Roos, 2016, p. 27). He also mentioned work on weekends and weeknight parent meetings as stressors that go beyond the school day. He also pined that being in so many meetings behind closed doors was an obstacle to his being present for the community:

> So, I feel like when those opportunities are out there then I really want to participate, I want to be present, that's one of the things that I, that I can do, but as with any educator, it comes at the expense of, you know, personal time--I don't know if that's any, I don't know a way around it, but it's, you know, having enough staff that could, kind of, help balance it out is something that we, you know, we try to do. (Roos, 2016, p. 27)

Andrew related that his personal time has suffered because of his many tasks and his desire to participate in the community.

In his journal, Andrew recorded that hiring was his biggest stressor of the day ten times and graduation preparation twice. He mentioned teacher complaints, wife's stress, school field trip, teacher complaints, and teacher versus teacher conflict one time each. He left the biggest stressor field blank 14 times.

He felt confident in his ability to handle personal problems, relating that his wife was supportive and his children kept him grounded, and described them as a support network. His description evokes the social support model of stress (Sarason, Sarason, & Shearin, 1986; Vaux, 1988). However, his inability to be completely present for his family is another stressor:

> Trying to be present at home and feeling like I can't be as present as I want to be and that stresses me out because I'm like well what can I do. I just need to take the time, but then I know that that means I'm not working, and you know there's always something in the back of my mind that's like, I need to. Now that work is just sitting there, and it's not getting done, you know. And, and so just trying to balance that. (Roos, 2016, pp. 29-30)

Andrew's incomplete work infiltrated his thoughts at home and distracted him from being present for his family.

Andrew felt that the breathing practice was helpful, and he was able to do the practice three times a day. He completed the practice during the middle of the day only four times during the intervention. Much like Margaret and Antonio, Andrew adapted the breathing practice for use during the school day because he could not take eight minutes of alone time. He used the breath as walked between meetings to prepare himself physically for the subsequent meeting. He also adapted it for use at other stressful times. He provided an example:

> These boys didn't take care of their academics, you know, repeated reminders from teachers and me and communication to the family, it's like, they're still boys, they're still learning, you know, but it didn't stop me from, like, being like, what else could I have done. Alright, I'm just gonna walk with them, I'll do my breathing as I walk, I know it's not the ideal way to do it, but I feel like it, it is, it kind of focuses me a little bit more, it puts things in perspective, and you know if I don't have the ability to like, "Hey boys, like, go on your own, I need, I need 8 minutes of silence. I need to close my eyes, you know, you know, it's like, I can't do that, but I can be mindful and kind of how, as I walk with them. (Roos, 2016, p. 29)

Andrew controlled his breath as he walked with the students, and he observed that the attention to the breath enhanced his focus and altered his perspective for the better. He combined the breathing with the mindfulness training he learned from an organization called Breathe for Change, which taught Andrew to attempt mindfulness in all activities, including walking and typing. The result was an adapted breathing with mindfulness while walking.

Andrew communicated that the stressors had not gone away, but his response to the stressors have changed. He shared an anecdote that described a newfound calmness that he was presenting to his team:

> But, I do feel like the, the way that it impacts like my mentality and, kind of, I can keep that, you know, I've heard from a few teachers, like, over the past, like, couple weeks, like, "Man, like, you just always, the past two years, like, the way the year has ended has

> been so crazy for you, and like you have so much like to manage, like, but you're so, like, calm," and I'm like, "Well thank you," so I feel like that kind of like outward appearance, you know, that I'm able to, to present that, you know, in the calm amongst the storm, you know, and convey, like, just confidence and, and stability, you know, to those around me, you know, is helpful. (Roos, 2016, p. 30)

Andrew responded to the pressures of the end of the year with more calmness than he did in previous years, and he felt that he was presenting his staff with more confidence and stability in his personality.

Finally, the breathing practice gave Andrew a refuge from his thoughts about work. He related some examples:

> Just as you conclude a day and kind of get ready, you know, so it's like, I don't need to think about this as I lay down to go to bed, like, I need, let me get some breathing in, I don't need to, to stress out about this as I walk into the building. You know, the breathing kind of just, you know, just be, be present, be mindful of kind of what I'm about to do instead of focusing on the stress part, you know. That's the, that's the hope, you know. And I feel like it's helping. (Roos, 2016, p. 30)

Andrew conveyed an ability to be mindful, to be present, and to be free from stress as helpful consequences of the breathing practice.

Andrew attributed his reduction in his role-based stress to more frequent and more positive meetings with the President of his school and not to the breathing.

Summary of Principal 4

The quantitative data corroborated the qualitative data for Andrew; both indicated a reduction in perceived stress. Even though he took the second survey at the end of the year, a more stressful time for Andrew, both his ASI score and PSS score dropped by -.20 and -10 respectively, both noteworthy decreases. While he stayed in the same quintile for the ASI, he moved down two quintiles on the PSS, from high stress to low stress. In the interview, Andrew confirmed that he used the breath to decrease his annoyances, manifested a newfound calmness

and confidence to his staff, and allowed himself to be present in the moment away from work instead of ruminating about work. Andrew believed that pranayama practice had a noticeable effect in reducing perceived stress.

Principal 5

Jennifer Lunbeck is the principal at a coed Catholic elementary school with circa 320 students, 36 faculty and staff, and no assistant principals. She is single in her early thirties, holds a master's degree, identifies as Catholic, and has been a principal for one year. She took the first round of surveys on April 26, 2016 and the second on July 5, 2016, and she performed the intervention from May 2 to June 2 of the same year.

Table 14: Principal 5 Survey Results and Breathing Log Data

ASI Average Survey 1	2.37 Moderate Stress
ASI Average Survey 2	2.03 Moderate Stress
Average ASI Change	**-0.34**
Change in	
Task Based Stress	+5
Role Based Stress	-8
Boundary Spanning Stress	-6
Conflict Mediating Stress	-2
PSS Score Survey 1	26 High Stress
PSS Score Survey 2	24 High Stress
PSS Change	**-2**
Recorded Minutes of Breathing	360

Average Minutes Breathing per Day	11.3
Most Common Breath Ratio	5:1:5:1

Jennifer also kept a complete journal with regards to recording the breathing ratio, the numbers of minutes of breathing, and biggest stressors. On three days, she did no breathing; on five days, she did the breathing practice once per day; on seven days she did the practice twice per day; on 11 days, she did the practice three times per day; and on six days, she did the practice four times per day. She had a larger decrease in perceived stress as indicated on the ASI (-.34) and a marginal reduction in perceived stress levels as indicated by the PSS (-2). Role-based stress and boundary spanning stress were both decreased by more than 10%, triggering follow-up questions in the interview.

In her journal, Jennifer recorded "not enough time to get everything done" as her biggest stressor on 20 different occasions. Other biggest stressors included teacher issues on four occasions, discipline issues on two occasions, parent guild member on three occasions, and end of the year deadlines and potential breach in the security system each on one occasion.

Indeed, not having enough time to get the job done was a theme in the interview as well. Emails were particularly stressful:

> I can, like, you know, be catching up on emails, leave for an hour and come back and have a full page of emails again, and it takes me, you know, like, it can take me half an hour to respond just to one if it's like, you know, one that you have to be really political with and be careful of how you, so I think for me, I would actually say that's probably my biggest stressor is I just, and that makes me feel like I'm failing, like that I can't keep up with the emails. I hate that. (Roos, 2016, p. 81)

Jennifer shared that emails were indeed her biggest stressor, because of the sheer number that can arrive in a short period of time and because of the length of time it can take to respond to an email.

Another aspect of not having enough time to get the job done was her participation in activities outside of the normal school hours. She described her participation as time consuming:

> Even this Saturday, there is an auction item that, somehow, they expect me to be at even though they never told me, and I got an email that I have to be there on Saturday, and it's like, it's summer, like, it's a Saturday in July, and I have, I'm trying to like catch up on my own personal life, but I would say there was at least, there was probably a three month period where I was here until, 4 or 5 nights a week, I'm not getting home until after 10 PM, and then that's when those emails, like, together those two, to me, are like the deadly duo. (Roos, 2016, p. 81)

For Jennifer the time commitment caused by staying late after school compounds the stress caused by the emails. She feels that the job commitments are infringing on her personal life, and together, both the emails and the after school activities form a "deadly duo."

Another aspect of the heavy workload that was difficult to manage was the disruptions to her plans caused by unexpected occurrences in the school day, and her problems were compounded by the lack of an assistant principal to help relieve her burdens:

> And you map out your day, and by 6am your plan is shot, you know. Like you wake up thinking I'm gonna do this, this, this, and then you get a text message that people are sick, or, that people are sick, or you get, suddenly I'm subbing in a classroom, or a parent needs to talk to you. And our problems are very minimal here actually, like, knock on wood, our parent community is awesome and very respectful, it's just, it's just ridiculous how much work there is. Yeah, and I don't have an assistant principal, so that makes it, yeah, a lot worse. (Roos, 2016, pp. 81-82)

Although she appreciates the support of her parent community, there were last minute parent meetings that disrupted her plans or last minute substituting that she had to personally take care of.

Jennifer feels that she was so stressed most of the time that her normal stress was tantamount to the extreme stress of other people. Taking 12 units of graduate school classes and an online class to clear her credential also added to her stress. She felt unsupported because she had jobs that no one was helping her with, especially technology upgrades, and she also related that the end of the year was more stressful.

Another more complex facet to her stress was her concern for other people's opinions, especially when she was not able to complete her tasks:

> It's the stress of not being able to reply to emails and knowing that people probably think that I'm being lazy. I hate that. That feeling drives me nuts or think that I'm not keeping up with my ordinance. No. I am. I'm just triaging, and that is at the bottom of my list, whereas there's these other things that have to get done. I just, I hate feeling like I disappoint people, so that, that's really the cause of the stress, I think, not the workload. The workload is manageable as long as I can triage it. It's the not being able to keep up, and disappointing people that makes me stressed. (Roos, 2016, p. 82)

Jennifer does not want other people to think that she is lazy and does not want to disappoint others. She prioritized her workload, attending to the most important items first, but her inability to manage the prodigious volume of the work and the threat of disappointing others were the root causes of her stress.

Her primary coping technique was working out, but the increased workload of her first year as principal and a new commute from the suburbs to San Francisco have curtailed her ability to exercise:

> Now in order for me to be able to workout and shower and get here on time, I'd have to like be working out at 4:30, and you know, not getting home until after 10, that's just not realistic. So, that has been the, with this job, the, a stressor is not being able to work out and then all the late night meetings. It's like, even though there's a beach right down the street and I could go running, there's no shower or anything, so I haven't done a great job of coping with stress like I usually have. (Roos, 2016, p. 82)

Working out requires a shower afterwards, and because there was no facility on her campus where she could shower and because her work commitments extended into the evening, her ability to work out was compromised.

Jennifer described the breathing intervention as both relaxing and helpful for dealing with stress:

> I do feel like I have relaxed more with the breathing interventions, I definitely—like, there are times where I felt so stressed that I was just like okay, stop, shut your door and just breathe. And it's helped. (Roos, 2016, pp. 82-83)

Jennifer had the wherewithal to realize when she was getting stressed and responded by retreating to her office and breathing. The effects of the breathing worked almost immediately:

> Well it calms me down immediately. So even if I only had like one minute that I could do it, it calmed me. Even like I told you I'll do it a couple, like twenty seconds of it calmed me down so I know that it's, it's really healthy, and I know that. (Roos, 2016, p. 85)

In addition to the immediate calming effect of only a few breaths, Jennifer found that it also had an effect on her ability to focus: "Yeah, it was just very, it was relaxing, and I felt almost, I found that I was able to fully focus on mornings when I didn't feel like I was stressed to get somewhere and in the evenings" (Roos, 2016, p. 85). Jennifer noticed the bigger gains in focus in the mornings and evenings.

Jennifer attributed her decrease in role-based stress to her attitude towards her uninvolved pastor, which was initially frustrating. However, now Jennifer is somewhat accepting: "Yeah. So, for me, I'm kind of like, my supervisor just lets me do things and that's that, so. Again, I've kind of thrown my hands in the air like whatever" (Roos, 2016, p. 84). She did not attribute a change in her role based stress to the breathing intervention. Similarly, Jennifer has attributed

her reduction in boundary spanning stress to a comical cognitive reframing of the expectations put on her by the archdiocese:

> And so I have to raise like five or six million, and I'm kind of like, sure. I'll add that to my to-do list. Whereas, it's kind of one of those things that if you told me I had to raise $300,000, it would almost be more stressful for me than five million because I'm kind of like, what, where's the realistic expectation of that. And it will happen somehow, and I'm not gonna stress about it, and because I have more years to do it, it's just, you know, that's kind of comical actually. (Roos, 2016, p. 84)

Jennifer expressed sarcasm over the unrealistic expectations put on her by her superiors and decided not to be stressed by it. Again, she did not attribute the reduction in boundary spanning stress to the breathing.

Summary of Principal 5

The quantitative data somewhat supported the qualitative data in that the breathing was helpful in reducing perceived stress. Jennifer's ASI score changed -.34, a noteworthy reduction, and her PSS score changed -2, only a small change. She remained in the same quintiles for both tests, moderate stress for the ASI and high stress for the PSI. However, she took the second set of surveys in the middle of summer, a time of less stress for principals, and she only averaged 11.3 minutes of breathing per day. Thus, these quantitative results must be interpreted cautiously. In the interviews, Jennifer felt that the pranayama relaxed and calmed her and helped her to focus on her work both mornings and evenings. With positive qualitative feedback and positive but cautious quantitative results, the breathing probably had some impact in reducing Jennifer's perceived stress.

Principal 6

Stuart Tarin is the principal at a coed Catholic high school with circa 350 students, 75 faculty and staff, and two assistant principals or deans. He is married in his mid fifties, holds a

master's degree, identifies as Catholic, and has been a principal for ten years. He took the first round of surveys on April 26, 2016 and the second on June 23, 2016, and he performed the intervention from May 2 to June 2 of the same year. However, his journal only contained data from May 2 to May 17.

Table 15: Principal 6 Survey Results and Breathing Log Data

ASI Average Survey 1	2.26 Moderate Stress
ASI Average Survey 2	1.94 Low Stress
Average ASI Change	**-0.32**
Change in	
Task Based Stress	-4
Role Based Stress	0
Boundary Spanning Stress	-3
Conflict Mediating Stress	-4
PSS Score Survey 1	20 Moderate Stress
PSS Score Survey 2	14 Low Stress
PSS Change	**-6**
Recorded Minutes of Breathing	343
Average Minutes Breathing per Day	21.4
Most Common Breath Ratio	8:2:8:2

Stuart kept a complete journal with regards to recording the breathing ratio, the numbers of minutes of breathing, and biggest stressors. However, he stopped recording on May 17, but in the interview stated that he continued twice a day for the rest of the intervention period. He kept

the morning and evening breathing practices. On one day, he did no breathing at all; on four days he did the practice twice per day; on eight days, he did the practice three times per day; and on three days, he did the practice four times per day. He had a larger decrease in perceived stress as indicated on the ASI (-.32) and a sizeable reduction in perceived stress levels as indicated by the PSS (-6). Conflict mediating stress decreased by more than 10%, triggering follow-up questions in the interview.

For his biggest daily stressors in his stress log, he recorded family issues with wife or child five times, hiring issues three times, and each of the following one time: flight to Seattle, 12 mile hike, dispute with colleague, unreasonable parent complaint, graduation script, and walk down memory lane. Concerning the level of stress in his life, Stuart cautioned against becoming addicted:

> You get addicted to running at Defcon 4, you know, and my friends who are still public school principals, whom I have a number, that's where they live, and you get addicted to it, like you get addicted to drama and, sort of, crisis. And I don't think it's very sustainable in terms of your life long term, but you can go for a pretty good stretch of time running in that milieu and then it's hard to decelerate, for whatever reason, right, for those of us who are in that space, even though you know it's good for you. (Roos, 2016, p. 5)

Although he knew that slowing down from that high stress state was beneficial, he warned that there was a possibility of addiction to the drama and a lack of sustainability.

In the interview, Stuart shared that staff members do not understand his goals and expectations, and this miscommunication became a source of frustration for him:

> I tend to push the train a little bit….As a person. And, I get frustrated. It's a psychological issue for me. I get frustrated when people aren't keeping up, and it's not really fair, actually. And then they feel, sort of, beleaguered because they feel like they're being held to these unreasonable standards. (Roos, 2016, p. 1)

When his staff react to his unreasonable standards or are unable to keep up, then Stuart feels frustrated. The lack of appreciation and lack of understanding also factored into this dynamic:

> I think periodically they don't get what I'm trying to accomplish, so I've taken now to, sort of, saying at the opening inservice, "This is what I'm doing this year. You know, so, here we go." And then I'm wrong a lot, and I, sort of, have to admit that, but, but not everybody's on board all the time, and I think those people feel, probably, underappreciated by me, so, and then I feel badly about that. (Roos, 2016, p. 1)

In response to his staff's lack of understanding, Stuart has tried to share that vision at the start of the year, and he felt badly about those staff members that did not share in his vision because they did not feel appreciation from him.

Stuart had a positive response to the breathing practice, specifically in regards to its ability to help him with his emotional control:

> The anger piece was the part that the breathing helped the most with….because I run hot, and it helped me not run hot….The morning was peaceful and reasonably easy, sometimes at night I would fall asleep for the last one. (Roos, 2016, p. 1)

Stuart recognized that anger was one of his more challenging emotions, and he saw a correlation between the breathing and not being angry. He also attributed peacefulness to the morning practice and an implied relaxation to the practice in the evening. Concerning the effectiveness of the breathing practice, Stuart noticed, "And that was real. And when I could do it 4 times a day, that was pervasive. And in the days where I would miss 3, I ran hotter" (Roos, 2016, p. 4). Stuart felt that more breathing practice during the day made for better results in managing his anger. Stuart also added a detail about the practice that took place before lunch:

> And the way that my day tends to run is it gets more frenetic as the day goes along, and, sort of, running in parallel with increased intake of coffee and a host of other things, and so by, you know, lunch time, 1 o'clock in the afternoon, I tend to be pretty high and what that would force me to do, because I had to do it before lunch was to sort of calm before lunch, and lunch was peaceful. I didn't talk, people asked me what was wrong because I wasn't talking because I was actually feeling pretty good. So I think that would...that would help. (Roos, 2016, p. 2)

Stuart noticed that the practice calmed his frenetic day so much that he not only felt good but also changed his behavior, being satisfied with silence during his lunch, a behavioral shift that others noticed.

When I asked Stuart about the change in his conflict-mediating stress, he attributed the change to his feeling a separation from the immediacy of the conflict as a result of the breathing practice:

> It was easier. If I'm not frustrated then I can manage conflict between other people much better….But the people I manage aren't there necessarily, they're younger or they're in a different space or they don't feel compelled to do that [take responsibility for their role in the conflict] and in that role you're playing, psychologically, a really different role for everybody, so people with authority issues hear that person, I think I'm in a parental role with young teachers a lot and they're bringing stuff to the table that I don't understand and I'm probably complicit in some way too, but I was just more, I felt a little more removed from the immediacy of the interactions and I kind of helped less, I think is probably what happened. So I could sit there and be like, "This isn't actually about me." You know what I mean, what I'm trying to accomplish, the best way going forward. So I think, probably, it was, you know, the anger would be the most telling of those in that I just felt less hot. If that makes sense. (Roos, 2016, p. 4)

Because of the space provided by the breathing practice to step back and examine a situation, Stuart realized that the conflicts he was managing were not generated by who he was but by the psychological projections of his younger staff. That awareness empowered him with the ability to think of the best strategy to resolve the conflict.

Stuart's other coping technique was exercise, but he complained, much like Jennifer, that he did not have the time for a full exercise session because of his busy schedule. He appreciated that the breathing practice could be completed in eight minute sessions:

> And it [exercise] is a much bigger time commitment, which was sort of the beauty of this, is that it was short. And I think probably if you had asked me to meditate for 24, 24 minutes in a chunk, it definitely wouldn't have happened, right. So the fact that it was short and sweet, 32, I guess, so the fact that it was short and sweet made it feel like I can

> afford eight minutes, you know what I mean? So I think that, that it was well structured. (Roos, 2016, p. 2)

Stuart liked that the time length of the intervention and felt like it was manageable. His journal indicated that he was actually able to do the breathing during the school day 10 out of 16 times (62.5%). Concerning the time period when he was not journaling, it seems that he kept the first and last practices of the day:

> The first one in the morning I loved, for sure. And then when things got crazy, the ones that dropped out, the ones after school tended to drop out, the pre-dinner one, and I tried to make it up with the night time one, which also helped me fall asleep. (Roos, 2016, p. 4)

Though he did not state it explicitly, because he was only doing two practices per day, he may have dropped the practice before lunch as well.

Summary Principal 6

Stuart's quantitative results for the most part corroborated his qualitative results. He had a sizeable decrease in perceived stress on the ASI (-.32) and a reduction in perceived stress on the PSS (-6). He moved from moderate stress to low stress on both tests. He did take the second set of surveys a few days after his school's graduation, as the year was winding down, and his breathing log was absent of data after May 17. In the interviews, he attributed a direct causation between the pranayama practice and a reduction in his anger, with more minutes of breathing correlating with a larger reduction in anger. Stuart also attributed pranayama practice with an effect of both peacefulness and creating space for better managing conflicts. Stuart seems to have experienced a noticeable reduction in perceived stress as a result of the pranayama intervention.

Principal 7

Emily Smith is the principal at a single-sex Catholic high school with circa 220 students, 30 faculty and staff, and no assistant principals but a student support team consisting of three people. She is married in her late forties, holds a master's degree, identifies as Anglican, and has been a principal for three years. She took the first round of surveys on March 31, 2016 and the second on May 19, 2016, and she performed the intervention from April 10 to May 10 of the same year. However, her journal only contained data from April 2 to April 26, with several days missing .

Table 16: Principal 7 Survey Results and Breathing Log Data

ASI Average Survey 1	1.66 Low Stress
ASI Average Survey 2	2.03 Moderate Stress
Average ASI Change	**+0.37**
Change in	
Task Based Stress	+7
Role Based Stress	0
Boundary Spanning Stress	+7
Conflict Mediating Stress	-1
PSS Score Survey 1	11 Low Stress
PSS Score Survey 2	17 Moderate Stress
PSS Change	**+6**
Recorded Minutes of Breathing	68
Average Minutes Breathing per Day	4.5

Most Common Breath Ratio	5:2:5:2

Emily did not keep a complete journal with regards to recording the breathing ratio and the numbers of minutes of breathing but did record ten of her biggest stressors. However, she stopped recording on April 26. From the journal entries, it appears that she only did one breathing practice per day: 11 recorded as a.m. practices, three as p.m., one as night, and one as midday. She had a larger increase in perceived stress as indicated on the ASI (+.37) and a sizeable increase in perceived stress levels as indicated by the PSS (+6). Both conflict mediating stress and boundary spanning stress increased by more than 10%, triggering follow-up questions in the interview.

In her breathing log, though by her own admission she did not feel that she was good at journaling in a tradition way, she recorded the following stressors: anticipation at the start of the week twice, meetings twice, board meeting presentation once, reflecting on the day once, and busy days or parts of days twice.

In the interviews, Emily reported having two main sources of stress. The first of Emily's major stressors stemmed from the pressure of trying to maintain a healthy work-life balance:

> But certainly it is balancing work with life outside of work and feeling the pressure of that and the sort of the, just having to, um, I don't know, serve multiple important variables and a lot of juggling, and a lot of it has to do with around child care. Not that my kids are especially young now but still like who's on deck to pick them up, do they have a driver to pick them up if no one's around. (Roos, 2016, p. 52)

Juggling the multitude of tasks associated with being a mother while being a principal added to Emily's stress. The second main stressor that affected Emily was the evening commitments that in her eyes had a performative quality:

> And it's sometimes not having enough energy to often the evening things that I have to do are very performance oriented. They're not necessarily...they're not like, you know, colleague conversations or conversations with students. I mean, they're often quite performative and that's a stress. (Roos, 2016, p. 52)

Emily felt stressed by the evening commitments during which she felt that she had to be on stage for others.

One way that she handled the pressure to balance work and home life pressure was to create a space between the two for herself:

> I do feel like I am quite good at keeping appropriate boundaries between work and life which is why sometimes I, I struggle with it, right? And so I feel like, you know, I'm at work and I'm dealing with work stress whatever that is that, that's very professional. It's boundaried [*sic*] in a professional way and personally I feel like you know my life is quite stable….but I feel very confident about managing, and why? Because I do have a strong commitment to selfish time in terms of taking care of myself, so swimming, and it's probably come up in some other areas, is a big component of my life in terms of creating sometimes buffer space between work and home. (Roos, 2016, p. 52)

Emily considered her home life to be quite stable, perhaps hearkening to the social support model of stress (Sarason, Sarason, & Shearin, 1986; Vaux, 1988). Moreover, she coped with the stresses of work and family by giving herself time in neither sphere, time during which she could exercise. She did report that she had previously experienced anxiety around flying, especially around flying home to see her family, so she had done some cognitive behavioral therapy that included breathing techniques. For Emily, her swimming also focused on regulation of the breath:

> So I just talked about my relationship with swimming which I found, which I find actually to be very breathing intensive, so, you know, you swim that it's for me swimming has been always less about speed and much more about technique and for me breathing technique is a core part of why I swim and my relationship with the water. (Roos, 2016, p. 53)

For Emily, a large part of swimming was focusing her attention on both the technique of the body and the regulation the breath.

After having been asked about the increase in boundary spanning stress, Emily reported that the second set of surveys was taken during senior week, a week involving pre-graduation ceremonies and many interactions with parents. Having high expectations for herself around this week added to her stress: "We are holding the experience of people, and you want to host them well. You want them to feel acknowledged. You want them to feel really sort of like this is their, the crowning moment in their experience of the school" (Roos, 2016, p. 54). Two difficulties with senior week emerged for Emily--managing ungrateful people and operating as a host rather than as an educator:

> I also know that in this job especially sometimes you feel like you're dealing with a client base that is potentially tweaking towards ingratitude or negative judgment. And those are the people who come out sometimes in senior week and, or week like that, you know, where you are trying to please. Your job is during that week hosting and accommodating and really it makes me feel like I, feel like I work as a concierge at a five-star restaur[nt], five-star hotel or something…. pleasing individuals like that who sometimes are coming out as individuals because they are, I don't know, unhappy in some way, complaining about some, that's, that's tough going. (Roos, 2016, p. 55)

Emily did not enjoy senior week because she did not enjoy working in hospitality and did not appreciate the complaints of ungrateful constituents. She also responded to the question by identifying three times of the year that were especially stressful for her--beginning of the year, admissions season, and the end of the year:

> Sometimes there is crunch time and there are deliverables and I think clearly I don't enjoy that feeling quite so much as suddenly when you're, it's like when you're a student and you've got all the papers due and, and, you know, it's like how do I manage the crunch, how do I delegate effectively, how much do I trust the team, you know, all of that sort of sense of sharing and, and also just getting it done, and, and checking it off and, and coping with the crunch time. (Roos, 2016, p. 56)

Emily attributed her increase in stress at the end of the year to this feeling of having to manage too many things at once.

When I asked Emily if she thought that her stress levels had changed during the course of the intervention, she responded emphatically: "They were absolutely at a peak during the week of May 16" (Roos, 2016, p. 54), that is, during senior week. She even experienced physical symptoms as a result of her stress, i.e., she felt a tightness:

> As senior week started to take over there was one, there was one day when I stopped that relationship with breathing during my school day and I really felt the impact of that--negatively, in the stop, and it took me a while actually to reset…. It took me that week to get through and maybe that's because I'm not especially skilled at it yet or I couldn't find the, the depth of breath I needed so even though I was trying to do it morning, the fact that I had down time during the day was tough and I felt very tight but I was conscious of the fact that I could have done something against that, but I somehow didn't find the time. (Roos, 2016, p. 53)

During a time when Emily stopped the breathing practice and could not find the time to resume, she felt a tightness in her chest.

One positive remark that Emily had to share praised the benefit of a morning breathing practice:

> So in the last two weeks, yes, that is when the speed of ramping into senior week and senior week happened, and I was, I think I already said this, I was able to take the time and I needed to, so it was good for me to wake up in the morning and take that time and breathe into the day. (Roos, 2016, p. 57)

She also mentioned that she kept the evening practice as well, although she was unable to breathe during the school day or before dinner.

Summary of Principal 7

Both the quantitative data and the qualitative data showed an increase in perceived stress over the course of the intervention. Emily increased her ASI by .37 and her PSS score by 6

points, bringing her from low stress to moderate stress on both the ASI and the PSS. In the interviews, Emily reiterated that the week she took the second set of surveys was a more stressful week than usual. However, it is not clear how often she did the pranayama intervention. Her journal has her breathing 68 total minutes on 15 different days, an average of 4.5 minutes per day, whereas in the interviews she added that she was doing an evening practice as well. If her evening sessions averaged the same amount of time, then she may have practiced 9 minutes per day. Although she may have received some benefit from the pranayama practice, both the quantitative and qualitative data suggest that her perceived stress increased at the end of the intervention.

Summary of all principals

The following table includes a summary of the demographic data of the participants. Their schools are co-ed unless otherwise indicated.

Table 17: Summary of Demographic Data

	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Emily**
Age	60s	60s	40s	30s	30s	50s	40s
School Type	K-8	K-8	K-8 (boys)	5-8	K-8	9-12	9-12 (girls)
Student Size	c. 250	c. 300	c. 350	c. 120	c. 320	c. 350	c. 220
Faculty & Staff	33	23	60	20	36	75	30
Assistant Principals	1	1	2	2	0	2	0
Marital Status	Married	Single	Married	Married	Single	Married	Married
Education	Doctorate	Masters	Masters	Bachelors	Masters	Masters	Masters
Religious identification	Catholic	Catholic	Catholic	Catholic	Catholic	Catholic	Anglican
Number of years as principal	15	28	12	5	1	10	3
First Survey	4/16/2016	4/10/2016	3/22/16	4/15/16	4/26/16	4/26/16	3/31/16
Second Survey	5/18/2016	5/19/2016	5/12/16	5/22/16	7/5/16	6/23/16	5/19/16
	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Emily**

Two participants were in their 30s, two in their 40s, one in their 50s, and two in their 60s. Two participants were in charge of secondary schools and five were in charge of elementary schools. School sizes ranged from 120 students to 350 students, and the number of faculty and staff ranged from 20 to 75. Two participants were single and five were married. Six of the seven held advanced degrees, and all but one identified as Catholic. Three principals were relatively new (1-5 years), and four were veteran principals (10-28 years).

The following table includes all the quantitative data listed above with the mean and standard deviations values of each row reported as well.

Table 18: Summary of the Results of All Principals

	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Emily**	**Average**	**SD**
ASI Survey 1	3.05	2.37	1.37	2.26	2.37	2.26	1.66	**2.19**	0.54
ASI Survey 2	2.86	2.48	1.69	2.06	2.03	1.94	2.03	**2.16**	0.39
Average ASI Change	**-0.19**	**0.11**	**0.31**	**-0.2**	**-0.34**	**-0.32**	**0.37**	**-0.03**	0.30
Change in TB Stress	-1	6	5	0	5	-4	7	**2.57**	4.20
Change in RB Stress	-5	-2	3	-6	-8	0	0	**-2.57**	3.91
Change in BS Stress	2	1	1	-1	-6	-3	7	**0.14**	4.10
Change in CM Stress	-3	-1	2	1	-2	-4	-1	**-1.14**	2.12
PSS Survey 1	21	10	12	25	26	20	11	**17.86**	6.77
PSS Survey 2	12	10	10	15	24	14	17	**14.57**	4.89
PSS Change	**-9**	**0**	**-2**	**-10**	**-2**	**-6**	**6**	**-3.29**	5.56
Total Breathing Minutes	984	814	422	672	360	343	68	**523**	315.07
Average Minutes per Day	31.7	27.1	14.1	21	11.3	21.4	4.5	**18.73**	9.40
Most Common Breath Ratio	6:2:6:2	6:0:6:0	6:2:6:2	6:2:6:2	5:1:5:1	8:2:8:2	5:2:5:2	n/a	n/a
Cycles per minute	3.75	5	3.75	3.75	5	3	4.29	**4.08**	.73

Four principals experienced a reduction in stress on the ASI, while three did not. There was a reduction in TB stress for two principals, RB stress for four principals, BS stress for three principals, and CM for five principals. Five principals also experienced a reduction of stress on the PSS, while two did not. Because of the lack of control group and the small sample size, none of these reductions are significant. Wayne, Andrew, and Stuart, all of whom were able to average more than 20 minutes of breathing per day, scored lower on both the ASI and the PSS and in the interviews reported profound changes in their perceptions of stress. The following table lists the Pearson's Correlations of Total Breathing Minutes and Average Minutes of Breathing per Day with the changes mentioned above.

Table 19: A Table of Pearson's Correlations

Correlations	R	R Squared
Total Breathing Minutes and PSS Change	**-0.64**	**0.41**
Total Breathing Minutes and ASI Change	-0.31	0.09
Average Minutes per day and PSS Change	**-0.69**	**0.48**
Average Minutes per Day and ASI Change	-0.42	0.18
Total Breathing Minutes and Change in TB Stress	-0.32	0.10
Average Minutes per day and Change in TB Stress	**-0.56**	**0.32**
Total Breathing Minutes and Change in RB Stress	-0.38	0.14
Average Minutes per Day and Change in RB Stress	-0.23	0.05
Total Breathing Minutes and Change in BS Stress	-0.09	0.01
Average Minutes per Day and Change in BS Stress	-0.15	0.02
Total Breathing Minutes and Change in CM Stress	-0.06	0.00
Average Minutes per Day and Change in CM Stress	-0.30	0.09
Cycles per minute and PSS Change	**.52**	**.27**

The bolded items indicate the larger correlations. However, the only significant correlation ($p < .05$) at five degrees of freedom (n-2) and with a one tailed t-test, which was used because previous research indicated that stress is reduced during pranayama, was the correlation between

Average Minutes of Breathing per day and PSS Change (significant at -.669). The pranayama practice accounted for 48% of the reduction in stress as indicated by the PSS. The Total Breathing Minutes correlated with the change in the PSS score at a nearly significant level; significance was -.669, while the correlation was -.64. Another large but not significant result was the correlation between cycles per minute and the change in the PSS (.52), i.e., the slower the rate of the breath during the practice correlated with a decrease in perceived stress as measured by the PSS. These quantitative data indicate that the pranayama intervention was successful at reducing perceived stress as measured on the PSS.

Research Question 2

What was the experience of the pranayama practice for Catholic school principals?

The following themes were gleaned from the interview data about the experience of performing a pranayama practice: 1) Novelty of pranayama, 2) Adjustment period to the practice, 3) Ease of implementation, 4) Alone time, 5) Benefits of practice, 6) Obstacles to the practice, 7) Shorter breathing sessions, and 8) Counting the breath.

Novelty of pranayama

All seven principals reported that practicing a simple Ujjayi Pranayama with a measured count was a new experience for them. Some principals did have some previous experience with mindfulness and others with different breathing techniques. Stuart, who had done some pranayama, described the novelty of the approach:

> I used to go to a place called Sivananda Yoga Vedanta Center which was in the Haight and I was, you know, I liked the meditation piece. I did pranayama in the context of yoga, but never the way you taught me. It was the nostril one that we did, and I liked that, and then my kid was born, and my yoga went the way of the dodo. (Roos, 2016, p. 5)

Although Stuart had done some alternate nostril breathing, he had not done Ujjayi pranayama apart from the asanas of yoga. Wayne had done some Transcendental Meditation, a mindfulness technique, but his only breathwork came from soccer: "I do a lot of soccer related training so I do stretching and breathing and stuff there, so it might not be formal yoga or formal breathing but I've got a certain routine of exercise and breathing" (Roos, 2016, p. 18). Andrew had practiced meditation 15 years ago right after college but has not done any formal breathwork. Antonio has learned some meditation from his wife who practices yoga and mindfulness and has been doing some shorter breathwork for stress reduction, yet the formal Ujjayi pranayama was new to him. Emily has gone to a Zen center a few times, considered her swimming practice to be a mindfulness practice, but discovered Ujjayi pranayama for the first time in this study. Jennifer has been practicing Bikram Yoga and has used a breathing mantra she learned in high school:

> When I was a senior in religion class we did a big focus on meditation and breathing exercises and so I've, I've always noticed in my life that when I start to get stressed, I would always do that little breathing mantra she taught us. (Roos, 2016, p.85)

However, sitting Ujjayi pranayama was new to her. Finally, Margaret declared that she had no previous experience with yoga, pranayama, or mindfulness.

Adjustment period

Two principals noticed that there was an adjustment period to the practice, a length of time before the practice felt natural. Wayne described his adjustment: "You showed me how to do it, then I had to put the time frame in it, and I had to, uh, get used to the cadence, you know, six-six-six, and I would say, generally, the six-to-two cadence worked" (Roos, 2016, p. 18). For Wayne the cadence took some getting used to. It also took time for him to focus on his breathing

rather than on outside distractions: “I got used to more of the intrusions, you know, that are on the outside; uh, honed down so it wasn’t much of an intrusion, so I could really focus in on what I was doing” (Roos, 2016, p. 19). Unfortunately, I do not know whether he was talking about some time within one practice or a period of, for example, several days. Jennifer also described an adjustment period, and the pranayama practice helped her gain control of the breath:

> Okay, at first, I think it took me a few days to finally get it started. Oh, and at first I kind of, I, I noticed when I was breathing, I’d have to like stop and regroup myself because it was hard to keep those breaths for a while and again it might be because I had, I broke my septum and had to have it fixed. But, the more I, the more regular I did it, the more I was able to control the breathing. (Roos, 2016, p. 85)

Her breathing was initially characterized by interruptions because she could not keep the ratio that she wanted, but over time she was able to keep a regular breathing count. Jennifer also had an adjustment period in relation to the stress she experienced around carving out the time for the practice:

> Like at first doing it, I was stressed doing it for the first few, like, times because I was like, “I don’t have time of this, I don't have time for this!” but then I realized it was, there was a benefit to it, so I stopped getting stressed out. (Roos, 2016, p. 85)

After having experienced some stress because she did not feel like there was sufficient time for the breathing, Jennifer started to experience the benefit of the breathing practice and her stress was mollified.

Ease of implementation

Several principals commented on the ease of implementing a simple breathing intervention. Stuart liked the brevity of the practice: “I liked the practice, myself. I also found it reasonably easy to do, and as I said, the way you set it up, so I’m not sitting there for 30 minutes, worked well with my concentration” (Roos, 2016, p. 6). Stuart was impressed by the efficiency

of the intervention in that there was a lot of benefit for the small amount of time invested.

Although Wayne had some initial trepidation about the breathing, he also found that it was easy:

> I had some hesitancy when you said, "Four times a day, eight minutes." I said, "Man, where am I going to get that? Where am I going to get the time? How am I going to do that? I know how my days roll," but once I made the commitment to do it, then I found that I could do it easily, and I got it part of my routine now, so, that's what I'm gonna keep doing. (Roos, 2016, p. 20)

Wayne embraced the breathing practice as part of his routine after making a commitment to it. Emily reiterated this sentiment: "I found it really, the discipline of it, especially after the morning and then into the evening, that was easier. It's easier than flossing frankly" (Roos, 2016, p. 58).

Alone time

Principals felt that time alone ameliorated their ability to practice pranayama. Emily felt that the breathing was easiest when she had time alone:

> I could carve out selfish time, self-time in the afternoons or in the evenings when I was back at home or before, just before heading home actually when no one else was, that was, that was a good time too. That was a space I could create for myself. (Roos, 2016, p. 62)

She was also helped by her husband creating space for her in the mornings by taking the dog on a walk. Antonio also commended his spouse for her help in supporting him with the pranayama practice but did not specify whether this help was in relation to creating space.

Jennifer credited her secretary with helping her to create the space needed for an easier practice:

> Something that's helped me it would be the secretary respects my wishes to be left alone. I have found too, like the parishes, there, so there are times where I'd have to walk to the parish, and I would like sit somewhere and like take a few moments to myself so being able to kind of like walk out of the building helped and there were a few times too where I would sit in my car at home in the garage before I let myself go back upstairs to do it. (Roos, 2016, p. 88)

Jennifer found alone time with her secretary's assistance, in walks to the parish, and in her garage. Andrew was able to carve out some time without interruptions on public transit:

> I think I mentioned to you through some emails, like, I had to kind of, didn't want to start off going to Bart, but kind of in that second half it was like, nobody's going to bother me on Bart, you know, like I could put my phone in the backpack and not like, you know, worry about getting texted, or you know, a calendar invite reminder popping up, but it's not the ideal, but it's where I found the time to breathe. (Roos, 2016, p. 34)

Even though there was jostling and noise, the train became a space in which Andrew could practice. Wayne also found places outside of the workplace to practice: "I found different areas where I could do it, varied, you know, from my office to the church, to a bench on the street where I took a little walk, uh, to my car" (Roos, 2016, p. 19). Although his office was a place that he might be disturbed, the church, bench, and car were spaces of alone time.

Benefits of practice

All principals noticed some benefits to the pranayama practice. These benefits included a) Good feeling, b) Relaxation/Calm, c) Better pacing, d) Reduced negative emotions, e) Increased focus, and f) Miscellaneous benefits.

Good feeling. All seven principals reported a good or positive feeling after practicing pranayama. Stuart mentioned that "it feels really good when I do it" (Roos, 2016, p. 5) and "that helps me, actually" (Roos, 2016, p. 6). Jennifer seconded this idea: "I mean my attitude is that it's a positive, it's a positive practice" (Roos, 2016, p. 86). Although Andrew was experiencing allergies, he still reported, "I'm like, 'oh man,' but still though, still feel good about where, where I was heading, what it was really set up and working the way that it was supposed to" (Roos, 2016, p. 34). Emily linked the breath to both physical and mental health: "I found it a really good reminder to breathe, as rule number one in terms of like your mental physical health

and being" (Roos, 2016, p. 58). Wayne was pleasantly surprised: "I think it's worthwhile, I think it's a positive thing and, you know, I appreciate, you never know what you're gonna do with a doctor of research when you help somebody out, but this has personally been very beneficial" (Roos, 2016, p. 19). When Margaret was not feeling the stress from having to schedule the breathing when she was too busy, she found some benefit: "Well I think when I did it, when I wasn't feeling pressured, it was fine and it was positive" (Roos, 2016, p. 70). Antonio could feel the changes taking place in his body:

> Yeah, so I, I enjoyed the intervention and the breathing exercises. I did feel that while doing them I could almost physically feel this the whatever neurotransmitters or endorphins or whatever it is the chemical that is released in your body. I could feel that in a physical way, so I, so I enjoyed it. It's just really, you know, I think it has, it does have positive effects with me. (Roos, 2016, p. 46)

Antonio had a positive physical response to the pranayama practice, and perhaps he was experiencing the shift to parasympathetic dominance noticed by other researchers (Pal, Velkumary, & Madanmohan, 2004; Sengupta, 2012).

Relaxation/calm. Several principals reported experiencing both relaxation and calm and sometimes grouped these concepts together. Jennifer, before reporting that "yeah, it was just very, it was relaxing" (Roos, 2016, p. 85), described the effect as being almost immediate:

> Well, it calms me down immediately. So even if I only had like one minute that I could do it, it calmed me. Even like I told you, I'll do it a couple, like twenty seconds of it calmed me down so I know that it's, it's really healthy. (Roos, 2016, p. 85)

Jennifer felt that the pranayama practice had a quick and immediate effect of calm. Margaret was more tepid in her response: "Somewhat relaxing, yeah, kind of mindless after you went on" (Roos, 2016, p. 70). It was not immediately evident whether Margaret felt that mindlessness was a positive or negative effect. Andrew mentioned twice that he thought that the breathing

intervention was working and described a typical situation about how his staff thought he was calmer: "'Man, like, you just always—the past two years, like, the way the year has ended has been so crazy for you, and like you have so much like to manage, like, but you're so, like, calm'" (Roos, 2016, p. 30). Stuart felt a sense of calm when he was holding the breath after inhale or after exhale: "I liked the holding, actually. Like, when I was calm, it felt a little oxygenated, like I could've hung out a long space for a longer period of time, because it was just quiet" (Roos, 2016, p. 7). Wayne felt a clarity that he attributed to relaxation: "I'm clearer on what, on how to approach things, and, uh, I think it's a direct result of being more relaxed" (Roos, 2016, p. 17).

In addition to describing the practice as calm and peaceful, Emily experienced some tightness as a result of some stress and used the breath to relax that tightness:

> It's just that whatever my stress mode is where I really get a bit tight, quite literally, tight and locked up, it takes a while for that to undo it. It almost becomes this, sort of, physical reflex, tightness, so it took me a good few days of continuing these events and working through them breathing. It took me some breathing through until after a couple of days I had unlocked my tightness. (Roos, 2016, p. 62)

Emily felt that a couple of days of breathing had helped her to relax a stress-induced tightness that she had experienced.

Two principals noticed a connection between the exhale and relaxation or calm. Margaret relaxed more in the exhale part of the breathing cycle: "I mean the exhale was not, it was kind of that was where I found more relaxation I think" (Roos, 2016, p. 71). Whereas Margaret felt that the exhalation produced more calm, Stuart felt that he could exhale longer when he was calmer: "When I was really calm, my exhale was significantly longer. Like, in the morning, when I was pretty peaced out, it was 5:30, and I would, sort of, sit by myself, the exhale was longer" (Roos, 2016, p. 6).

Better pacing. Four principals reported a beneficial effect on how they approached the pacing of the day with respect to being able to manage the many tasks they were responsible for. Wayne noted: "I think it gave me a better sense of, uh, again, pace" (Roos, 2016, p. 22). Andrew felt the pranayama helped him to transition from one task to another:

> It is kind of trying to reset and think about like, alright, like I can't let that [previous interaction], I can't dwell on that, I can't let however that made me feel kind of beat me up, you know, physically or mentally, and so I needed to, I used it as a tool to transition. (Roos, 2016, p. 39)

The pranayama reduced his emotional response to interactions so that he could more easily move to the next task without rumination.

Emily described the breathing practice as being able to prevent a principal from conveying the impression of being too busy:

> So this idea that, you know, you could certainly do a version of this job where you're embodying it in a way where it's all about you're the headless chicken, you're so busy, and [snaps fingers] yes, yes, … and sort of the idea that breathing practice and that, that mantra of thinking, okay, I'm going to be, I'm going to embody what it means to be head screwed on rather than, you know, headless chicken, I think is more inviting as a leader. It's more, I don't know, it's just more compelling. (Roos, 2016, p. 65)

The headless chicken image conveyed an understanding of a principal who had lost the ability to manage the pace of the day, and Emily felt that the breathing helped to manage that pace. Similarly, the pranayama practice gave Andrew a break in his busy schedule:

> I am, you know, really a, an introvert, I need kind of that time to myself to kind of repower, re-energize and get ready to go out and be in such a role as, you know, a principal, and it's like I really liked, kind of, the freedom I felt like, the freedom and the validation, like hey, I'm participating in this study, like, let me have my door closed and like let me like turn the lights out and that was really, they're things that I kind of wanted to do anyways, like I need some quiet time. (Roos, 2016, p. 34)

The breathing intervention validated Andrew's desire to have a break from his busy schedule and gave him the space and time to recharge.

Stuart felt that the pranayama allowed him to slow down so much so that he began to feel emotions that he had not allowed himself to feel:

> So, sometimes, paradoxically, I guess it's not a paradox, is, is that I would slow down enough that I would actually have feelings that I, you know what I mean? Like, my brain would get quiet and I, sort of, would be like, "I'm sad," you know? Or, "I'm worried," or whatever it was going to be. (Roos, 2016, p. 8)

He was so busy that he did not have the time even to have feelings, and the practice gave him that space in his day.

Reduced negative emotions. Some principals attributed a reduction in both anxiety and anger to the breathing practice. Wayne felt less anxious in the context of a confrontation with a parent:

> The parent situation that I had to deal with, I thought that it was, I felt better about it, was less anxious moving into it but, nonetheless, it was a very anxious situation, I think, to attribute it to the breathing exercise. (Roos, 2016, p. 22)

Wayne had the opportunity to elaborate on the effects of reduced anxiety that he gained from the pranayama practice:

> So I guess the relax, you know when you're anxious, you're, you're, you have a tendency to flutter your thoughts about what could be and what could not be or you kind of, uh, postulate that maybe aren't going to happen, so, I think the less stressful you are, the more realistic you are, you know, and, uh, you don't let the anecdotes of your own mind get in the way with reality. (Roos, 2016, p. 22)

Concurrent with the reduced anxiety was also a sense of relaxation, and Wayne's mind dwelt less on hypothetical situations that might provoke anxiety. Antonio also understood the breathing to have a biochemical means to reduce anxiety before a difficult meeting:

> Just, you mean, going into it, just feeling the you know those anxiety hormones that one feels, you, you, I could physically get them to dissipate to start, and so you go into it already a little calmer a little less anxious and defensive and all the other feelings that people have and while you may acquire some of those as you go through a meeting at least the start of it felt better. (Roos, 2016, p. 48)

Antonio felt that practicing pranayama before a meeting would reduce the amount of anxiety experienced at least at the start of the meeting.

Stuart emphasized that one of the chief benefits was the reduction in the anger that he experienced at work:

> Stuart: So I think, probably, it was, you know, the anger would be the most telling of those in that I just felt less hot. If that makes sense.
>
> Scott: It does. I'm happy to hear that.
>
> Stuart: Yeah. And that was real. And when I could do it 4 times a day, that was pervasive. And in the days where I would miss 3, I ran hotter. (Roos, 2016, p. 4)

Stuart attributed the reduction in his anger to the pranayama practice and noticed that on days when he missed the practice, he was angrier. Additionally, Wayne indicated that he was less likely to get frustrated or angry in a meeting because he was practicing the breath, and Emily felt that controlling the breath helped to prevent unwanted emotional or physical reactions.

Stuart was generally more aware of his emotions as a result of the breathing: "What I was aware of in the course of the process is that I would get quiet, and then, you know, it's like my consciousness would go down into my, you know, heart" (Roos, 2016, p. 8). He clarified that he was more able to grieve for the loss of his mother during the breathing intervention.

Increased focus. Four principals felt more focused as a result of the breathing intervention. Wayne noticed that his focused was lengthened but did not elaborate further. Antonio felt that his focus was better only immediately after breathing:

> I felt you know certainly right after going through the practice, during and then right after, felt that there was a heightened sense of focus. I don't know if there was you know, if you were to ask me that question an hour after having done. Was there much difference? I'm not sure. (Roos, 2016, p. 48)

Antonio did not notice a long term benefit to focus but acknowledged a short term benefit. Jennifer felt like she was able to focus better both in the mornings and evenings. She commented on an evening time benefit: "I did notice like at some nights when I was like super-stressed and I would like try to do the breathing just in bed, that would help me to like, let work go, it will be there in the morning" (Roos, 2016, p. 89). The breathing helped her to be more present in the moment at home.

Jennifer further explicated that her ability to focus on particular tasks was linked to a sense of calm:

> Well, I definitely, the breathing definitely helps you focus because it just, once it calms you, it's like you can recenter yourself instead of when you're in that moment of stress, it's like, okay, I have to do this this, but when you take a few steps back, like, well, actually, I don't need to do that, I can just do this. So I think that really helped me to refocus. (Roos, 2016, p. 89)

Jennifer felt that the breathing practice helped her to stay on task. Andrew affirmed this observation:

> I was able to maintain focus and I know, like, it was all during the time, you know, of the breathing and I was trying to not let the stress take over what the task was, you know, and so I was more able to focus on the task and the work and the purpose of that work as opposed to like how that work was making me feel, whether it was positive or negative. (Roos, 2016, p. 35)

Andrew believed that his emotional response to the task at hand was lessened and consequently his ability to focus increased. He also saw his increased ability to focus as a benefit to other people and as a benefit to his leadership.

Andrew noticed that the Ujjayi sound helped him to focus better within the context of the breathing practice itself:

> I don't know what it was about the sound but I think it just kind of helped me focus on like, this is more than just breathing, this, you know, just having, knowing that I needed to make that sound kind of helped put in the state of mind where I like, I'm not just

> breathing normally, I'm engaged, and this is the reason I'm engaged in this practice right now, and it just kind of helped make, keep me focused on, on that, and was a way to help me avoid some of the other distractions outside. (Roos, 2016, p. 36)

The Ujjayi sound acted as a focusing tool to reduce the impact of outside distractions and to allow Andrew to be more present in the moment of breathing.

It must be mentioned that Margaret specifically noticed no change in her ability to focus.

Miscellaneous benefits. Wayne noted benefits that were not recounted by other principals, and those observations are included here. Wayne felt that his ability to communicate improved: "My communication seems to be a little better too, it terms of, uh, being a little bit more lucid and how I express my questions, my answers" (Roos, 2016, p. 22). He also stated that "it gave me a better sense of hope" (Roos, 2016, p. 22). Wayne, who also had a prayer practice, felt that even his reflections were deeper as a result of the pranayama practice.

Obstacles to the practice

Several principals experienced obstacles to successfully practicing pranayama. These obstacles included a) Allergies, b) Falling asleep, c) Outside interruptions, d) Difficulty producing the Ujjayi sound, e) Difficulty lengthening the inhale, f) Difficulty slowing down the breath, g) Lack of discipline, and h) Lack of time.

Allergies. Both Andrew and Jennifer reported slight impediments as a result of their allergies. Despite being stuffed up and being unable to breath as deeply as he wanted, Andrew still experienced a benefit to the practice:

> And now I'm, allergies, I don't know if I sound like nasally, so now I can't get those full breaths into me because of like allergies and I'm like stuffed up and whatever, so I'm like oh man, but still though, still feel good about where, where I was heading, what it was really set up and working the way that it was supposed to. (Roos, 2016, p. 34)

The allergies caused obstructions to Andrew's breathing because he was congested, so he was unable to breath as fully as he wanted. Jennifer also mentioned that controlling the breathing was more difficult with her allergies: "The more regular I did it, the more I was able to control the breathing. I did notice with allergies though that that got messed up too" (Roos, 2016, p. 85).

Falling asleep. Wayne noticed that when he did the practice in the evenings before bed, he would have trouble continuing the practice because he would fall asleep:

> Sometimes when I was really tired the exhale would just knock me out and I would have to kind of catch myself and get back up. Yeah, on the times when the factors indicated it where I was really tired, didn't get a night's sleep, I had a long work week, and I just, the nature of the beast. (Roos, 2016, p. 18)

The long exhale had the effect of relaxing Wayne to the verge of sleep, interrupting the breathing practice, though perhaps such an interruption might be seen as beneficial because he was sleep-deprived. Wayne elaborated further:

> I would say that, that was particularly challenging you know when I'm really tired, I just, I just didn't have the strength. I guess I was feeling so comfortable that the exhale just kind of took the air out of me, and I just kind of almost on the verge of falling asleep and then I'd catch it and come back. It didn't happen all the time but, you know, it happened sometimes. (Roos, 2016, p. 19)

Wayne experienced this obstacle only occasionally, but this soporific side-effect might have useful implications for principals suffering from insomnia. Stuart also noted that the practice helped him to fall asleep but did note that falling asleep was an obstacle to his evening practice.

Outside interruptions. Three principals had difficulties limiting the number and frequency of outside interruptions, which had the effect of limiting or eliminating their breathing practice during the day. Andrew had trouble from interruptions from his faculty and staff:

> It got to that busy time of year and like, as much as I would literally turn off the lights in my office, close the door, put on the sound machine, you know, you got people peeking through the blind, and like knocking, and I told everybody, I'm like, I'm part of this study, and I'm gonna be, you know, I'm gonna be closing my office door for like eight

> minutes, you know, like, maybe sometimes in the morning, if I can't do it before, like sometimes in the middle of the day, you know, doesn't stop people from, from kind of knocking on my door and wanting to like just, because, like I mentioned earlier, like, their priorities and they, they want my support, so that became a little more difficult. (Roos, 2016, p. 34)

Despite his rather thorough boundary-setting, Andrew experienced interruptions from his faculty and staff that disturbed his practice. During this period, Andrew took to practicing on the trains of public transit rather than in his office because he could breathe without interruptions there, even though he could not maintain the same breath ratio on the train. Andrew also considered putting the eight minutes of breathing on his calendar which he shared with his staff and faculty as well as creating a sign that read "Pranayama in Session" but implemented neither of these solutions.

Wayne also experienced outside intrusions whose frequency diminished over time: "I think the intrusions on the outside got less, you know, unless it was a very apparent intrusion with a walkie-talkie and, 'Wayne, I need you in the office in five minutes,' you know, that kind of thing" (Roos, 2016, p. 19). Despite a reduction in frequency, Wayne still experienced some external interruptions resulting from his responsibilities as principal.

Emily had a large glass window on the wall of her office, a window with no blinds, shades, or curtains, and simply the possibility of interruptions hindered her practice:

> Having a glass, who knows how my relationship with the breathing might have been had I not had glass windows in my office, you know, if I had actually gone in the closet. You know, just sort of, just the, the hecticness of the days plus the transparency or visibility of, of me and, you know, didn't, was a burden or hindered my feeling that I had that space, that me-space during the day to sort of engage in this, right, at a deep level. (Roos, 2016, p. 62)

Both her visibility to her subordinates and the business of her days limited her breathing practice sessions at school.

Difficulty producing the Ujjayi sound. Three principals reported difficulty in producing the glottal contraction and its associated sound while practicing. Although the sound is not a necessity for stress reduction (Mason, et al., 2013), the contraction of the larynx and partial closure of glottis can assist in slowing down the pace of the breath. Indeed, Stuart found that his breath ratio was reduced when he could not produce the Ujjayi sound:

> I found when I was stressed, like, keeping my throat in that space where you're getting that, sort of, more impactual [*sic*] breathing was harder to do, so I would, like, because I was in a hurry, so I would breathe in with my throat open, and then you can't actually breathe in for an eight count, you know, I'd get to two-four, and I'd be like my lungs are full. (Roos, 2016, p. 5)

Stuart unearthed a correlation between his own stress levels and his inability to produce the Ujjayi sound, and without that sound, he experienced a 50% reduction in breath ratio. Similarly, Antonio shared that he could not produce the Ujjayi sound but did not report any negative consequences: "The one that I could never really get and I kinda gave it up was the ujja [*sic*] sound. I never really, I just never, I just figured that that was the least of my worries" (Roos, 2016, p. 46). It is impossible to know whether Antonio would have had a different experience had he properly implemented the Ujjayi sound, but he was indeed correct in assuming that the the Ujjayi sound is not a necessary requirement for stress reduction (Ghiya & Lee, 2012; Mason, et al., 2013). Finally, Jennifer made a brief mention that producing the sound was "tough" (Roos, 2016, p. 87).

Difficulty lengthening the inhale. Three principals had some issues with lengthening the inhale. Andrew felt that his lung capacity was the problem:

> Lengthening the inhale was something that I was working towards. In the most ideal environment lengthening the inhale was a little bit more challenging just because I feel like that's building up the lung capacity, and I know that like I'm, I'm not exercising as much and so like my lung capacity isn't kind of what I would like it to be if I were exercising more. (Roos, 2016, p. 36)

Andrew embraced the inhale as a challenge that he embraced with a growth mindset and also reported that the exhale was indeed easier. Margaret contrasted her experience with the inhale to that of the exhale:

> The inhale was harder. The lengthening was, was not, I mean the exhale was not, it was kind of that was where I found more relaxation I think. I don't know why the inhaling seems more difficult. I mean, not terrible. (Roos, 2016, p. 71)

Margaret realized that the inhale was more difficult for her but did not understand a reason for the difference. Jennifer also mentioned that lengthening the inhale was more difficult for her.

Difficulty slowing down the breath. Both Stuart and Jennifer observed that slowing down the breath proffered some difficulties. Jennifer felt that she was running out of air and had to stop when she was inhaling and exhaling to a count of five seconds:

> Even though I might have put like the five one five one I might've had a stop and regroup myself because I found like I was losing oxygen, like I was doing it too fast, so I'd have to stop and then start it again. (Roos, 2016, p. 87)

The feeling of not having enough oxygen forced Jennifer to stop the practice, catch her breath, and then restart. Stuart noticed a connection between emotional excitement and difficulty slowing the breath: "When I was worked up during the day, it was hard. Like it was just hard to slow down the breath, to sort of get that done" (Roos, 2016, p. 6). This observation corroborates the notion that the breath and the mental state are linked (Brown & Gerbarg, 2009; Kraftsow, 2002).

Lack of discipline. Although all the principals who participated in the study agreed to perform the breathing practice four times a day, the majority were unable to fulfill their commitment on most days. Five principals spoke to the fact that discipline was required for the

practice in the face of the demands on their time. Both Antonio and Emily likened the pranayama practice to exercising. Antonio clarified this analogy:

> And it's, I think it's just feeling, being more disciplined about doing it. It's just, know you, it's almost like, the same thing with like, I almost put it in the same exact category as exercise. I like exercise. I like doing it. And I, you know, kinda feel guilty when I don't do it. And I just you know there's, I go through periods where I just kinda fall of the wagon and just don't do it on a regular basis. And it's almost one of those things for me kinda similar to the breathing exercises. If I don't do it at a certain time of the day, I just won't do it. (Roos, 2016, p. 46)

Not doing the practice on a regular basis and at a regular time hindered Antonio from consistent practice. Antonio saw the time management issue as something that he could address, but he had not dedicated the time for personal time in his day. Emily corroborated Antonio's exercise simile:

> What's hard about it is just it's like going to the gym, or finding the, it's just that you can tell yourself that it's not feasible. You can, you know, you can just sort of skip it that t[ime]. You know, so just the discipline. That's what's hard, amidst all the other things. So how do you, like, you can believe something theoretically, but in practice are you really embracing it? So I would need to work on the discipline. (Roos, 2016, p. 60)

Having the discipline to find the time to do the practice was an obstacle for Emily, especially the practice times during the middle of the day. In addition to the time management aspect of discipline, Andrew wondered whether he could continue the practice without the external encouragement inherent in a study:

> How can I hold myself accountable for it without like a google doc or like my little notes you know that I've been keeping track of and having your emails come to me like "Andrew, hey, you do it?" It's like, oh yeah. So without, without that, how do I hold myself accountable? (Roos, 2016, p. 36)

Andrew was not sure that he could continue the practice without discipline that came from participating in a study. Finally, Stuart pined that he had a tendency to discontinue practices that

were healthy for him, and Margaret observed that the eight minute commitment was the hard part for her.

Lack of time. Five of the principals pined that time constraints made it difficult to practice the pranayama, especially the session that was supposed to take place before lunch. Wayne stated:

> Well, I think, you know, it being the mid-morning and mid-afternoon can be problematic because things come up at a school where you just, you're so involved with that situation you don't necessarily have the time to do it. So, you've gotta be a little bit more flexible during those times. (Roos, 2016, p. 20)

Because Wayne had to be involved in helping to resolve impromptu situations, he did not have time to practice at the appointed times. Similarly, Jennifer experienced surprise events: "And what's hindered me was just the, all the unexpected little work things that come up and time. Time is the real, the real thing" (Roos, 2016, p. 88). Margaret also had difficulty making the time for the breath when she was in the middle of a task: "I think when I realized I had to do it and I was in the middle of something, and I, really, you know, didn't have time for it that was just another stress at that moment" (Roos, 2016, p. 70). Antonio also felt that because of his busy schedule, he was not able to add the middle of the day practice to his routine.

Jennifer added that it was not just surprise events but her busy schedule that reduced the length of her practice:

> Yeah, it was when I was physically here that was difficult, or waking up knowing I had a busy day and thinking oh my gosh, I have all these things to do. I have to get there. Then I couldn't do it as long. (Roos, 2016, p. 86)

Combining thoughts about her practice with her thoughts of the busy day may have been a stressor for Jennifer. Margaret explicitly labeled the middle of the day practice as a stressor and concluded: "The time is what has really hindered me, and I know that's foolish and that

shouldn't be the reason, but that's the reality" (Roos, 2016, p. 71). She felt that blaming the lack of time for hindering her practice was a foolish excuse yet acknowledged the reality of the time constraints. Emily also expressed her issues with time as a series of questions relating to patience:

> So how do I have the patience? How do I engage the patience to give it time, and not give it short shrift in terms of time, or you know, how do I, how do I see it as part of the process of getting even my mind somewhere else, right? In case it's not just physical; it's also that, opening up that mental space as well, so deepening the practice, actually. (Roos, 2016, p. 60)

She categorized her relationship to the practice vis-a-vis time in terms of patience and pointed out that mental space is needed in addition to the physical space. Emily also had difficulty practicing during the middle of the day.

Shorter breathing

Four principals adapted the eight minute breathing sessions into shorter, *ad hoc* breathing practices, specifically in anticipation for encounters that they perceived as stressful. Margaret described her use of the pranayama:

> The only thing that's really helped is when I get really stressed over some issue, usually like a, some kind of conflict you know, teacher parent, and I know it's going to be difficult, then I might, you know, try and do some before I have the meeting. (Roos, 2016, p. 71)

When Margaret felt stress over an upcoming meeting, she did some pranayama beforehand to relieve some of the stress. Antonio used a shorter period of breathing in the same way:

> But I do remember there were times during that month where I was about to enter a meeting or I was gonna, with a faculty member or a set of parents or with, specifically meeting with people where I would quickly take kinda deep breaths so I didn't do the whole practice where I did it for 10 minutes or 8 minutes before, but I would do literally just like four or five deep breaths and that was helpful. (Roos, 2016, p. 48)

Antonio found that some impromptu breathing before a meeting was helpful in reducing stress beforehand. Andrew even used it in response to an emotionally charged email:

> When I would get one of those emails, or when I would have one of those phone calls, or walk into or out of one of those meetings like, this is the time. This is the time for me to think about that breathing and even if it was like one minute….if I can just like breathe for a little bit right now, like, this is supposed to help me, you know, so like, let's try it, you know and, and I feel like everything we've talked about, you know, shows that it did help me. (Roos, 2016, pp. 37-38)

Andrew adapted the pranayama practice into shorter one-minute sessions to deal with the stress of emails, phone calls, and meetings.

Jennifer and Margaret adapted the pranayama practice to include breathing with the eyes open while performing other activities. Jennifer described her experience driving home:

> I notice that on my commute, even though I'm not closing my eyes obviously I'll like turn off my music and just like focus on breathing a little bit to take a few minutes to myself before, you know, I get home, start my new stress life. (Roos, 2016, p. 87)

Jennifer, in addition to using shorter breathing periods throughout the workday, used the breathing before embracing those stressors associated with her home life. Margaret even used breath awareness while she was meeting with someone:

> I was doing a teacher evaluation that had some challenges in it and I think I did some of it, some of the breathing... During the, the interaction, I just calmly tried to do breathing, you know, not eight minutes. Not so the other person would know, but, and I think that that did help, and it kept me balanced, and from flying off the handle. (Roos, 2016, p. 71)

Margaret used some short breathing to keep calm during a difficult interaction, perhaps without the other person even knowing.

Counting

Different principals had different reactions to the counting of the pranayama practice.

Some principals enjoyed the use of a metronome to help them count the breath. Andrew liked the counting with the metronome because it helped him focus and stay calm:

> I definitely used that app, and, yeah, it was, for me it was calming, it helped keep me focused, and you know kind of having headphones on Bart, or you know, or just being you know, when I was at home I didn't use the headphones, but, just allowed for me to kind of keep that, keep that count. (Roos, 2016, p. 38)

Andrew associated both calm and focus as byproducts of counting the breath with the metronome. Margaret used the metronome application as well; even though she felt that it was fine and easier than not using an app, she still felt that it was somewhat "unnatural" (Roos, 2016, p. 71).

A couple of principals had a neutral attitude towards the metronome but chose to count without it. Wayne used a clock on the wall to keep count initially but then transitioned to counting on his own.

> Initially I did, initially I did. I've got a clock in my house in the living room that goes tick, tick, tick, so I would say the first three or four days I was using that in the morning but once I got the hang of it I just, you know….and I'll be honest, once I had the cadence down: no problem. (Roos, 2016, p. 21)

Wayne felt that it was easy to count on his own without a metronome. Emily also counted without using a metronome because it reminded her of the counting she does in swimming:

> I sort of imagined myself literally taking breaths in the pool. Like it's the difference between, you know, the four-two is the difference between taking a breath in freestyle every other stroke or holding it for, you know, so it was, I tried to use that as a rule of thumb. (Roos, 2016, p. 62)

She had an internal sense of pace from swimming that she applied to counting her own breathing practice.

Several principals had a negative attitude towards the metronome because it annoyed them or others around them. Stuart succinctly stated: "Yeah, I didn't use the metronome because

it annoyed me" (Roos, 2016, p. 7). Jennifer, after attempting to use the metronome application, found it somewhat distracting:

> I used it at first, but then I didn't really like, one I kind of tuned it out, and then I was, go, thinking, so can I add a, it made me think more than I wanted to I was doing it. But so after I kind of got used to the, the timing with that, then I was able, and I would like kind of like do something like this with my fingers to try to help me. (Roos, 2016, p. 88)

Jennifer created a new way to count the breath using her fingers instead of an external device because she did not like the application. That application did not annoy Antonio but did annoy his wife, so he stopped using it:

> I tried to use a metronome at the beginning. Doing it in the morning before I got out of bed and at night when I was, it was challenging to use the metronome because my wife it would drive her crazy. And so I basically just say ok, but I actually felt it was relatively easy for me to keep count. After I got into the practice of it. So I stopped using it. I would use it on the rare I mean the occasions where I did during the school day…. I would use a metronome then just because I wasn't bothering anybody, and it was easy. (Roos, 2016, p. 47)

Although Antonio felt that the use of the metronome was easy, he felt that he could not use it at home because of the annoyances that it would cause to his wife.

Stuart, who was counting the breath without using a metronome, noticed that his counting speed changed depending on whether he was inhaling or exhaling:

> And I think I was inconsistent with counting. I think I counted, when I was calm, I counted faster on the inhale, and slower on the exhale, so I, yeah, my counting was probably not as consistent as it could've been. And it might've been that the thing to do for me would've been to use a metronome, until you, sort of, get that internalized, and, sort of, really internalize, and that probably would've helped me, but I didn't use it. (Roos, 2016, p. 7)

Because he had been instructed to keep the inhale and exhale at an equal count, he adapted his exhale counting to be slower because he was experiencing a longer exhale.

Of the principals, Andrew was the only one to share his interest in attempting to slow the breath down:

> I'm a math guy too, and I was like, you know, thinking, alright if I can get my breaths up to like 12, I'm doing really only like two cycles, you know, two and a half cycles like in one minute. You know it's like, and then it's like to think about like, wow I was really able to kind of control my breath for that long. (Roos, 2016, p. 38)

Andrew also shared that he had several practice sessions during which he practiced for more than eight minutes, particularly when he was on the train, and when he was on retreat he was able to inhale and exhale to a count of 10 seconds each.

The following table summarizes the themes that were found when the transcripts of the interviews were analyzed to answer Research Question 2.

Table 20: Summary of Themes for Research Question 2

Theme	Sub-themes
Novelty of Pranayama	
Adjustment Period to the Practice	
Ease of Implementation	
Alone time	
Benefits of Practice	Good feeling Relaxation/Calm Better pacing Reduced negative emotions Increased focus Miscellaneous benefits
Obstacles to Practice	Allergies Falling asleep Outside interruptions Difficulty producing the Ujjayi sound Difficulty lengthening the inhale Difficulty slowing down the breath Lack of discipline Lack of time
Shorter Breathing Sessions	
Counting the Breath	

Research Question 3

What other coping techniques do principals at Catholic schools use and how do the principals compare the effectiveness of the pranayama practice to their other coping techniques?

The following table shows the number of times each principal recorded a coping technique in his or her breathing log. The table is organized according to the categories set out in Gmelch and Chan's Coping Response Inventory (1994). Each heading also includes in parentheses the total number of times that category was mentioned by principals in the logs. Several principals, namely Antonio, Andrew, and Emily, did not record many instances of coping. Wayne and Jennifer recorded their coping techniques rather thoroughly.

Table 21: Coping Responses from Breathing Logs and Interviews

	Wayne	Margaret	Antonio	Andrew	Jennifer	Stuart	Emily	Totals
Social (14)								
Community Involvement	*Int*							
Family Time	1			*Int*				1
Happy Hour with Staff				1				1
Talk to Friend/Family	2	1			8	1		12
Physical Activity (43)								
Exercise	19		*Int*	2	*Int*			21
Long hike/walk	1					2		3
Running	2					5		7
Shorter Breathing Breaks		4	2	*Int*				6
Swimming							2	2
Walked Dog	4							4
Intellectual Stimulation (1)								
Journeying						1		1
Entertainment (8)								
Reading	5							5
Watched Sports						1		1
Personal Interests (17)								0
Cleaning House	1							1
Drink				*Int*	10			10
Eating					5	1		6

Managerial (19)								
Delegate	3							3
List Making		1						1
Planning	2	1						3
Strategizing	3							3
Tactical Problem Solving/Intervention	2							2
Talk to Colleague	*Int*	2						2
Talk to Past Principal					2			2
Talk to Staff	3							3
Attitudes (26)								0
Document/Journal	2							2
Mass	16							16
Prayer	7							7
Psychotherapy						1		1
Total Coping Instances	**73**	**9**	**2**	**3**	**25**	**12**	**2**	**126**
	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Emily**	**Totals**

"Int" indicates that the coping technique was mentioned only in the interview. Int is not factored into numerical counts.

Physical activity was the most frequently recorded coping category and was used by all seven principals. Five principals used social coping techniques, four used personal interest coping techniques, three used managerial coping techniques, two used entertainment, and only one used attitudinal and intellectual stimulation.

Some principals confirmed the data above in their respective interviews. Wayne, who mentioned physical activity as coping 26 times in his breathing log, played soccer three to four times per week, and having mentioned attitudinal coping 25 times, he had a healthy prayer life: "Prayer life is good--I like to go to mass. That fulfills me very much as a Catholic" (Roos, 2016, p. 15). He also had a core group of friends with whom he shared his challenges and "a real collegial relationship with the principals within our community and we can talk about things" (Roos, 2016, p. 15). Community involvement manifested in the interview as a coping technique that he did not mention in the breathing log: "I'm involved with my community in the Excelsior

district. I'm involved politically. I'm involved with union issues, housing issues, you know, I have, I mean there's other issues that kind of take you away from the basic stuff" (Roos, 2016, pp. 22-23). Jennifer also reiterated much of what she logged; she used exercise, the support of family and friends, the advice of a past principal, and adult beverages to help her cope:

> Yeah, exercise is really big for me, but again I've been really really bad about it and even just this week I've just started again and I already feel better, it's just, finding the time. And then my family and friends are huge supports to me just calling them and even our, the past principal who actually still works here, there are days where I would just go to her office and be like okay, I need to vent to you. Because I know that you know what I'm talking about and you won't judge me. So that's nice to have her support, and even our little cluster of principals like we all, we vent for half the meeting about things going on. And then you know, drinking but mainly in like a social way, like having a, like alright I just need to drink, I need to forget about this, and drink, have a glass of wine. (Roos, 2016, p. 89)

The only coping mentioned here that was not included in her log was the support of principals from other schools. However, she confessed that she was unable to exercise much anymore because she no longer had the time because of a difficult commute and the absence of conveniently located showers on site. Finally, Emily, who logged swimming twice, talked only about swimming as a coping technique.

Two principals admitted to having a small number of techniques to draw from. Margaret, who logged coping only nine times, mentioned social coping as one of her few techniques for dealing with stress, even though she logged it only once, and admitted that her coping repertoire was limited: "I, you know, I don't really have too many coping techniques. Probably talk to other people, find someone to talk to about whatever the issue is" (Roos, 2016, p. 75). Antonio only mentioned two coping techniques in the interview--exercise and deep breaths--but, much like Jennifer, intimated that he has not been exercising as of late:

> I think the only other, I mean, I've always known, you know, kinda deep breaths, so it's not something that's kinda like brand new, you know, I know that that's always a helpful

> technique. But I kinda you know on a more macro level I think exercise has been always something that's helped with stress especially that chronic stress. So exercise and unfortunately I just, I haven't, I've fallen off the wagon there when it comes to regular exercise, so that's something that I know that's helped me in the past. (Roos, 2016, p. 49)

Thus, the only technique that Antonio consciously used to reduce his stress was deep breathing.

Andrew, who logged exercise twice and happy hour once, added some breadth to his coping arsenal in the interview; he also spent time with his son or had an adult beverage:

> So you know, we talked about going to the gym and things like that, and if it's not going to the gym, I guess, you know, I would, you know, try to get, you know, get to my son's like t-ball practices and kind of being out at his games or you know, just physical activity is what I usually turn to, to cope with that. You know, I may have put on there like I might've had like a midweek beer, or like you know, like I had a scotch or something, you know, like, as I kind of wind down and get all the work done, like alright, this is how I'm gonna reward myself because I'm not going to the gym at, you know, ten o'clock, but I'll have a quick drink or something. (Roos, 2016, p. 39)

Andrew added family time, a social technique, and drinking, a personal interest technique, to his list of coping mechanisms. He also performed mindful breathing: "I could do mindful breathing, not necessarily pranayama. I could do mindful breathing as I'm walking to and from work, or as I'm walking to and from a meeting" (Roos, 2016, p. 40). Moreover, Stuart, who logged talking to friends once, physical activity seven times, journeying once, watching sports once, and psychotherapy once, confirmed these in the interview:

> All of these work, actually, for me, sometimes. I think the hard part is, like, some of them are distractions, you know. Eating and watching sports is, I distract myself with it. Psychotherapy is helpful, I think it lacks a spiritual component that would be useful in that context. Running always helps, but I'm not 25 anymore, so it's not as easy for me. Like, my knee hurts so I'm not gonna be able to go today. Walking is more time consuming. Friends, sometimes. So, it's a lot better coping strategy than I used when I was 30, which was, you know, booze and other stuff. (Roos, 2016, pp. 8-9)

Stuart no longer drank to cope and noticed difficulty with running. He also noticed that one theme of his coping was distraction, similar to the avoidance strategies of Suls and Fletcher

(1985): “Because I think my coping, one of my coping mechanisms was to stay busy. And that was, sort of, saying, ‘Well I gotta be busy for this period of time’” (Roos, 2016, p. 8). Rather than deal with his emotions directly, Stuart distracted himself from his emotional life by staying busy. He also created distractions from his emotional interiority by creating conflicts: “I think I also distract by just creating drama. Like, fight to fight, just to sort of distract myself and that, that I think helped” (Roos, 2016, p. 9). Along with eating and watching sports, producing conflicts and staying busy operated as avoidance strategies for Stuart.

With the interviews having been coded, the themes that emerged in response to comparing the pranayama practice to other coping techniques included 1) Ambivalence, 2) Complementary Benefit, 3) Efficiency, 4) Ease of Location, and 5) Discipline.

Ambivalence

Even though Margaret liked the calming benefits of breathing for acute stress, she preferred her other coping strategies to the pranayama practice and was the only principal to express this preference overtly. She stated:

> Yeah, [I used] the other strategies just because they were, more comfortable for me, more what I was used to. I, you know I would, I would do breathing, but not like, not like the eight minutes or anything like that, so. How did it compare? I think they compared, you know, when I did it, when I did the breathing in the, in a moment of stress it was helpful, it, you know I found it calming. Doesn’t get you through the problem though. Just calms you. Which is a good way to confront things though, calmer. (Roos, 2016, p. 75)

Even though she admitted that she found that breathing in a moment of stress was indeed calming, she preferred her other strategies for stress coping because of their comfort and familiarity. Although she believed that being calm was helpful in confronting her problems, more was needed to get through the problem.

Complementary benefit

Four principals noticed that the pranayama practice complemented their other coping techniques. Jennifer found that the breathing practice complemented her other social coping techniques for stress:

> I mean honestly I was doing the, the practice more than anything else because you asked me to. And I think the breathing helped me to like recenter myself and relax a little bit, but being able to talk to other people helps me to, helped me to kind of realize even more how ridiculous some stuff was. So talking it out I think with the breathing was a good mix of, because I think you always need, especially as a principal you do get so caught up sometimes in like, in seeing it one way that you need to take a step back too and talk to other people. (Roos, 2016, p. 89)

Jennifer felt that the pranayama was "a good mix" with talking about her problems with others and hinted that the centering and relaxation that comes from pranayama practice provided support to reframing situations, in this case, as ridiculous.

Wayne also felt that the breathing practice complemented his other coping techniques and differentiated the effects depending upon the stress level of the day:

> You know, I mean, I mentioned in the chart this day went smoothly, this day didn't, so I think, uh, when things are going smoothly, you know, these other things work in conjunction with breathing to make it a nice even day, but when things aren't going to smoothly that's when this exercise and discipline and breathing is all the better. (Roos, 2016, p. 23)

For Wayne, the breathing complemented his other coping techniques on the easier days, but he emphasized the importance of the breathing practice as a coping technique on the more difficult days. Wayne explained further:

> Well, I think another way of looking at it: this complimented what I'm doing in a big way. It just seemed to fit into who I am, personally; it fit into my need to take a little

> more time to slow down, you know, uh, more or less, you know, I think some days probably more, some days less, depending on the anxiety factors. (Roos, 2016, p. 23)

The pranayama practice complemented Wayne's other practices because it helped him to slow down and resonated with his self-image.

Antonio found that the pranayama practice amplified his current breathing practice that he used for coping:

> I've always known, you know, kinda deep breaths, so it's not something that's kinda like brand new, you know, I know that that's always a helpful technique. I think, you know, go back to the deep breathing has always been something I revert to when I am feeling acute instances of stress. I think the difference though now is having been provided this practice, having a better sense about what to do while you're breathing and just in terms of repetitive, you know, experience over a period of time versus just the one or two deep breaths, really having an insight into hold it for a second or two, exhale, because that, that is, it's something that I learned that I didn't have before. (Roos, 2016, p. 49)

Antonio discovered that the mechanics of the pranayama practice elevated his former breathing practice, which he had previously used for acute stress, "to the next level" (Roos, 2016, p. 49).

Finally, Emily noticed that the pranayama practice affected her swimming practice in a positive way:

> Yeah, I think we talked about the complementarity or the compatibility of, and that's really, I, I did enjoy that a lot, I really enjoyed the, because I even found that on days when I, and this is interesting, on days when I was not able to physically here engage in the breathing and I would go swim, and I don't know if it's even possible to do the breathing, I, I was conscious of wanting to find that groove, that breathing groove, in my swimming, right. So, and feeling, and Koret, I don't know if you know, has moved now to the long course lanes, so, and that has challenged me to find a bit more stamina, actually, in a different way. And so I felt stronger in the pool perhaps because of the breathing. And you know that there is a … there is a reciprocality [*sic*]? (Roos, 2016, p. 64)

Emily unearthed a reciprocal relationship between the pranayama practice and her swimming practice: the regularity of the breath that she gained from pranayama transferred to her breathing pattern while swimming, so much so that she felt stronger at swimming.

Efficiency

Stuart, who compared the pranayama practice to his exercise routine that felt like a larger investment of time, marvelled at the benefit that could be received from such a short practice: "So, I think the interesting part about the technique, is that I was just struck by the efficiency of it. Like, how short it is" (Roos, 2016, p. 9). He clarified with an explanation:

> And you don't need 30 minutes, so I think the efficiency of it is the part that I was struck by the most. And I think the bang for the buck for the amount of time is quite palpable. I'd be interested to know, you know, like, and not have to sort of pay attention to myself, like is four a day requisite? Like, how many 8 minute chunks do I need to get the benefit? Do you know what I mean? Like, that would be an interesting data point for me to look at. (Roos, 2016, p. 9)

Stuart felt that eight minutes was a small amount of time to invest for a rather large benefit in terms of stress reduction. He also mused about how many or how few eight-minute pranayama sessions would be necessary to produce the maximum benefit in terms of stress reduction.

Ease of Location

Both Stuart and Andrew liked the fact that the pranayama practice could be performed in many different types of locations. Stuart was enthused by the potential versatility of the location for practice and implicitly compared the pranayama practice to other meditative practices: "You can do it any place. You know, whatever, you could be sitting in your car, like, it doesn't, you know what I mean, you don't need an altar, a special cushion, you know what I mean" (Roos, 2016, p. 9). No special accoutrements were required for Stuart, and he liked that he could even do the practice in his car. Andrew also compared the location of the pranayama practice to location constraints of exercise: "I, yeah, I yes, I used the pranayama more frequently, because I

could do it on Bart, can't go to the gym on Bart" (Roos, 2016, p. 40). Andrew was able to do some of the pranayama practice as part of his commute to or from work.

Discipline

Three principals commented on the discipline that was required in maintaining a consistent practice. Antonio lumped the pranayama into the same category as exercise because both require discipline:

> And it's, I think it's just feeling, being more disciplined about doing it.... And I just you know there's, I go through periods where I just kinda fall of the wagon and just don't do it on a regular basis. And it's almost one of those things for me kinda similar to the breathing exercises. If I don't do it at a certain time of the day, I just won't do it. (Roos, 2016, p. 46)

Indeed, Antonio felt that he required more discipline for himself, and that lack of discipline led to both guilt and missing pranayama practices.

Both Andrew and Wayne found that they possessed the discipline to successfully implement the breathing practice. Andrew found the practice convenient and identified several keys to breathing success for himself:

> I definitely found, you know, that I was like, there was something very convenient to turn to, because you don't need, all you need to do is, all you need to do it, in my opinion, is just the willingness to do it and the discipline to do it, and just kind of, making it a priority of like I'm going to close my door or I am going to decide not to listen to like my music right now or not to like watch a video or you know surf social media, like, I'm gonna put on the metronome, put on my headphones, and I'm gonna breathe instead of do whatever else on your phone or you know, when you get home or when you're in the office. (Roos, 2016, p. 40)

Andrew asserted that an ability to resist the distractors of music, videos, and social media on his phone was required to maintain a regular breathing practice, and making the practice a priority in his life helped him breathe more regularly. Further, Wayne appreciated the discipline that the commitment to this study required of him:

> You know, because, uh, anybody can relax when there's not the pressure to do this, do that, or respond to that or when you have all these cross sections of factors coming together, man, you need some kind of a discipline behind it and this exercise gave me that discipline and complemented me with all the other stuff that I do, as a matter of fact. (Roos, 2016, p. 23)

Wayne observed that it was easier to relax without pressure, and he felt that not only did his pranayama practice provide him with discipline, but it also complemented his other coping techniques.

Summary

The themes that manifested themselves from the comparison of the pranayama practice to other coping techniques were 1) Ambivalence, 2) Complementary Benefit, 3) Efficiency, 4) Ease of Location, and 5) Discipline. Many of the principals lacked an awareness of having a full coping arsenal of techniques to draw from. All seven principals mentioned physical activity, five mentioned social methods of coping, four mentioned personal interests, and three mentioned managerial. Coping with attitudes and intellectual stimulation were the least mentioned methods of coping. Two principals still used drinking as a either a reward or as a means to clear the memory, with one principal having rejected drinking as an appropriate way to cope.

Research Question 4

What narratives are the principals able to tell about their emotions during the intervention? Is their emotional state different after the intervention? To what extent does pranayama help with emotion focused coping and emotion regulation?

Nearly half of the journal entries were incomplete with regards to strong emotional response to biggest stressors. However, the following table presents the emotions from the journals so that the emotions that Catholic school principals experienced can be outlined below. Emily made no entries, so she is not included in the table. Numbers higher than two are bolded for emphasis.

Table 22: Emotions Recorded in Breathing Logs

	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Totals**
Anger	2	1			**6**	**3**	**12**
Annoyance		1					1
Anticipation	2						2
Anxiety/Nervous	**13**	**5**					**18**
Bliss						1	1
Concern	**7**		1	1	1	2	**12**
Determination						1	1
Disappointment		1		1			2
Dread						1	1
Embarrassment						1	1
Empathy				1			1
Exasperation	1						1
Exhaustion/Fatigue	2				1	**3**	**6**
Feeling like a Failure					**10**		**10**
Frustration	**5**	**4**	1	1	**10**	2	**23**
Hurt						1	1
Nostalgia						1	1
Overwhelmed/Not Enough Time		1			**3**	2	**6**
Resignation						1	1
Sadness						1	1
Success				1			1
Worry	**5**			1		**3**	**9**
Total Emotional Entries	**37**	**13**	**2**	**6**	**31**	**23**	**112**
	Wayne	**Margaret**	**Antonio**	**Andrew**	**Jennifer**	**Stuart**	**Totals**

I was hoping for more complete journals so that I could find patterns in the emotional responses to stressors, either stressors whose emotional response changed over time or emotions which lessened over time. However, I found no patterns in the journal data with regard to stressors or emotions. Frustration, anxiety, anger, and concern were the most frequently reported emotions, in that order, with all six principals recording frustration, five recording concern, four recording anger, and two recording anxiety. Overwhelm and worry were also reported by three principals each.

During the interviews most principals were aware of a change in their emotional state at some point during the intervention, a change that they attributed to the breathing practice. Even Margaret, who initially denied any strong emotions as a result of stress, upon further questioning admitted that the breathing helped her manage conflicts. The following themes emerged from the data: (1) No Change; (2) Reduced Emotion, with the sub-themes (a) Anger, (b) Anxiety, (c) Intensity of emotional experience; and (3) Increased Emotion, with the sub-themes (a) Access and (b) Levity..

Table 23: Themes and Sub-themes of Emotional Experience from Interviews

Theme	**Sub-theme**
No Change	
Reduced Emotion	Anger
	Anxiety
	Intensity of Emotion
Increased Emotion	Access
	Levity

No change

Margaret was the only principal to suggest that her emotional state remained stable throughout the intervention:

> Emotional state before during and at the end? Pretty much the same. Probably a little as the, as the month went on probably a little more stress-filled, but, I mean nothing major going on. Nothing beyond the normal, you know, junk that goes with the end of the school year. Nothing, I mean nothing major happened on my personal life or professionally, those, pretty, pretty stable. (Roos, 2016, p. 76)

Margaret noticed the same increase in stress that some of the other principals noticed at the end of the year, but she experienced no corresponding increase in emotions. Margaret even felt hard-pressed to fill in the journal because she did not feel emotions from many of her stressors:

> I think most of them [the emotions] were around workload and people issues. And it, you know, it was interesting to come up with that column of, you know, what strong emotion, it was like, eh, I don't, you know, it's like it, so much of this is just normal, normal day to day stuff that I don't always associate a strong emotion with. (Roos, 2016, p. 75)

Although Margaret did feel some emotions around the stress from workload and from dealing with people, generally speaking she did not feel strong emotions.

Reduced emotion

Individuals felt that the breathing directly reduced the intensity of strong emotion experience or the length of time that an emotion was felt. Three sub-themes were found: a) Anger, b) Anxiety, and c) Intensity of emotion.

Anger. The first sub-theme was that the breathing helped with the reduction of anger, an observation that three principals noticed. Stuart even felt that the best part of the breathing practice was the reduction in anger: "Yeah, so, ironically, and I don't wanna, you know, pander to the beast too much, but this, the anger piece was the part that the breathing helped the most with" (Roos, 2016, p. 1). He offered this praise before I even asked him about the effect of emotions. He explained further at a later part of the interview:

> Yeah, it's, I mean, it's interesting. So, the heat diminished, which is necessary for me. So I would say diminishment of anger was the predominant, like the lowering of heat, I would say was the, was the way I would characterize the biggest evolution there when I was doing that [breathing] consistently. (Roos, 2016, p. 10)

Stuart described his experience of anger as heat, and he felt that the breathing helped to reduce the heat in his interactions. Wayne also related an experience that he had in which his anger subsided:

> Because I've had to respond to this parent before and, uh, I know the difference between how I responded now and how I responded before. I was a little, uh, of a shorter temperament before: prone to anger, prone to frustration; this time it was a little clearer on my approach and, uh--I work better. (Roos, 2016, p. 21)

Wayne observed that his second interaction with a parent, after he had started the breathing intervention, went more smoothly because the clarity helped him manage his anger. Similarly, Jennifer had an experience of reduced anger in response to a parent:

> J: I put anger in there a couple times more with that one mom because she would make me so angry with the kind of stuff. Like even last night she was in charge of our auction, had all these big goals of what we were going to make, and we brought in twelve thousand dollars on our auction, and she sent something for today's meeting saying we made eighteen thousand, and it's like, the amount of like, we've talked to her so many times. It's like why can't you just be honest. Like you keep telling me more money's coming in, but this is what the budget says, that money has not come in, like this is the bottom line, but like is it even worth the fight, because then it will become an email back and forth where it's just negativity, and it's like this morning I was thinking to myself like I just need to not even care about the parent guild all year and just let it be.
>
> S: And did the breathing help with the anger, or?
>
> J: Yeah, it did. I mean, I was still angry, but. But it took it from a ten to like a five. (Roos, 2016, p. 90)

Although the breathing intervention did not eliminate the anger and frustration that Jennifer felt from dealing with a parent who was mistaken about the finances of an auction, the breathing intervention did reduce the intensity of that emotional experience.

Anxiety. The next sub-theme under the theme of Reduced Emotion was the reduction of anxiety that was experienced by four principals. Margaret, who did not perceive a major benefit from the longer breathing practice, used a shorter impromptu breathing session to help her with the anxiety of a difficult teacher evaluation:

> M: I think I did some of it, some of the breathing. I did it before the full time, but then I think during the, the interaction, I just calmly tried to do breathing, you know, not eight minutes. And not so the other person would know, but, and I think that that did help, and it kept me balanced, and...from flying off the handle.
>
> S: Awesome. Do you find that you're using, that the situation that would be best for pranayama would be conflict mediation?
>
> M: I think so, I think that's, that's really anxiety causing for me. (Roos, 2016, p. 74)

Her statement "kept me … from flying off the handle" could refer to the reduction of anger as well, but because she described the situation as "anxiety causing," I have decided to include her statement here. At any rate, Margaret found that surreptitiously slowing down the breath during a challenging evaluation helped her manage that situation.

Similarly, both Antonio and Wayne saw benefits to breathing before meetings. Antonio adapted the breathing practice to help himself in challenging meetings:

> A: I didn't do the whole practice where I did it for 10 minutes or 8 minutes before, but I would do literally just like four or five deep breaths and that was helpful.
>
> S: Nice. And did that change your interaction within the meeting?
>
> A: I think so. At least, at least the start of it. Just, you mean, going into it, just feeling the you know those anxiety hormones that one feels, you, you, I could physically get them to dissipate to start, and so you go into it already a little calmer a little less anxious and defensive and all the other feelings that people have and while you may acquire some of those as you go through a meeting at least the start of it felt better. (Roos, 2016, p.48)

Antonio felt that he could start meetings with less anxiety if he practiced four or five deep breaths before the meeting began. Antonio believed that the change that took place as a result of breathing before a meeting had biochemical components:

> Just, you mean, going into it, just feeling the, you know, those anxiety hormones that one feels, you, you, I could physically get them to dissipate to start, and so you go into it already a little calmer, a little less anxious and defensive, and all the other feelings that people have and while you may acquire some of those as you go through a meeting at least the start of it felt better. (Roos, 2016, p. 48)

The benefits that Antonio received, in addition to the reduced anxiety, included an increased sense of calm and a decrease in defensiveness. He felt that meetings started better if he first did some breathing. Wayne also noticed a reduction of anxiety as well as other benefits for meetings:

> My communication seems to be a little better too, it terms of, uh, being a little bit more lucid and how I express my questions, my answers, my, so, you know, I'll give you an example: you know, the parent situation that I had to deal with, I thought that it was, I felt better about it, was less anxious moving into it but, nonetheless, it was a very anxious situation, I think to attribute it to the breathing exercise. (Roos, 2016, p. 22)

Not only did Wayne feel less anxious in his transition into the meeting, but he also felt that the breathing improved his communication ability during the meeting.

Finally, Stuart noticed a reduction of anxiety and sought to attribute that reduction to a cognitive reframing that happens as a result of the breathing:

> I was, sort of, easier on myself, like, dude. Because, you know, it brings things down to their appropriate size. Like, these, you know, mondo, sort of, emotional responses to things or anxiety about these things, like, at a certain point, you know, running will yield this too, but you come back and you're like, "Okay, come on, like, this isn't that big a deal," and it's not. Like, it's not. None of it is, actually, is a very big deal in the grand scheme. And that I think helps because you can, in the face of a lot of noise, you can elevate things out of their appropriate size in terms of consciousness and space and anxiety, so, I think that helps. (Roos, 2016, p. 12)

Stuart observed that the breathing, much like his experience with running, allowed him to reframe his perspective on events so that his anxiety also became reduced.

Intensity of emotion. The third sub-theme under Reduced Emotions was a reduction in the intensity of the emotional experience, i.e., although principals still experienced an emotion as a result of a stressor, the emotion was not experienced as strongly. Andrew explained how the breathing affected his emotional experience:

> Thinking back to those times of the conflict with teachers, the hiring process, like, yeah, those are, those would be things that I would definitely feel, and, but it's, you know, for me I guess the impact, can't take the stress away, can't, for me I wasn't always necessarily like not worried about who I, you know, if I was making the right hire or not concerned or like frustrated with you know the personnel situations, but it's like how long, how long did I worry, and how long was I frustrated with that situation, did I let it carry on into my next interaction with students, or my next meeting that was totally unrelated? And that's why I kind of used the pranayama as that tool to like, you know, diminish the amount of time that I felt that way, and to recognize when I was feeling that

> way, it's like, that's right, I got this breathing technique I'm supposed to be using, this is, let's use it. (Roos, 2016, p. 40)

The pranayama practice allowed Andrew to increase his skill at recognizing his own emotions and to curtail the length of that emotional experience so that it did not infiltrate into the interactions with others. Some stress remained, but the intensity of the emotional experience was curtailed. When I questioned Jennifer about her emotional experience, she also felt that the intensity of emotions was reduced when she described an interaction with a parent:

> But I did notice that certain stressors like that particular parent I've been able to deal with a little bit better, even though it still drives me nuts, I'm dealing with it much better. I'm trying to think of other stressors. Yeah, I would say it didn't, it didn't so much affect me overall in like how, like, I still feel like I'm failing on certain things, I still like am getting upset by certain things, but when I breathe, that, I can cope with it much better. (Roos, 2016, pp. 90-91)

Although Jennifer still felt the stress from the interaction with the parent, she felt that she was able to "deal with" and to "cope" more effectively.

Wayne noticed that he was not as apt to experience negative emotion as a result breathing intervention. Wayne reported an emotional tolerance for people not understanding what he's trying to communicate:

> I think so, I think, uh, probably a little bit more tolerant, I suppose, than I was a month ago, but Van Morrison has this song, "Why Do I Always Have to Explain?" and it's a great song because we're always in the position of explaining things---and people like to be understood, and, for various reasons, maybe I'm not as lucid, or people don't listen to what I have to say because they're in a previous position, frustrates the hell out of me. (Roos, 2016, p. 23)

Wayne has been frustrated by people who do not understand what he had been trying to communicate, and he concluded that the emotional benefit of tolerance for these types of miscommunication manifested as a result of the breathing.

Increased emotion

Several principals reported this increase in experience in a positive light. Two subthemes were found: a) Access and b) Levity.

Access. Stuart explained how he was able to access his emotions better, because he was too busy to access his emotions prior to the intervention:

> I would slow down enough that I would actually have feelings that I, you know what I mean? Like, my brain would get quiet and I, sort of, would be like, "I'm sad," you know? Or, "I'm worried," or whatever it was going to be. Because I think my coping, one of my coping mechanisms was to stay busy. And that was, sort of, saying, "Well I gotta be busy for this period of time," and then I would get calm and realize that I was feeling sad. So, which is advantageous for me, because I can't always access that stuff as readily as I should. (Roos, 2016, p. 8)

Instead of keeping so busy that he did not feel emotions, the breathing practice created the space to feel either sadness or worry. He further explicated that he was able to focus more on what he was experiencing emotionally:

> I was able to focus more on my emotional self, actually….What I was aware of in the course of the process is that I would get quiet, and then, you know, it's like my consciousness would go down into my, you know, heart, or whatever. (Roos, 2016, p. 8)

In placing his awareness on his heart and allowing himself to become quiet, Stuart was able to focus more on his emotional state of being.

Levity. Wayne also noticed an increase of levity, the second sub-theme of Increased Emotional Experience. Wayne said, "I noticed even after my breathing exercises that there was a little bit more, uh, levity to the way I approach things" (Roos, 2016, p. 24). Wayne attributed a lightness to his approach to the consequences of the breathing.

In summary, the following themes and sub-themes were observed in response to the questions about emotional experience: (1) No Change; (2) Reduced Emotion, with the

sub-themes (a) Anger, (b) Anxiety, (c) Length of emotional experience; and (3) Increased Emotion, with the sub-themes (a) Access and (b) Levity. .

Research Question 5

To what extent are there additional sources of stress for principals at Catholic schools?

The following table shows the top 10 stressors for the sample of Catholic school principals in this study from their first time taking the ASI. Bolded items match the top 10 stressors reported in Gmelch and Swent's 1977 study.

Table 24: Top 10 Stressors on the ASI for Seven Catholic School Principals

ASI Number and Text	Average Score	Type
10. Imposing excessively high expectations on myself	3.25	TB
12. Writing memos, letters, emails, texts, and other communications	3.25	TB
15. Attempting to meet social expectations (housing, clubs, friends, etc)	3.25	BS
18. Feeling I have to participate in school activities outside of the normal working hours at the expense of my personal time	3.25	TB
31. Feeling that meetings take up too much time	3.25	TB
20. Trying to resolve parent/school conflicts	3	CM
26. Feeling that I have too heavy a workload, one that I cannot possibly finish during the normal work day	3	TB
32. Trying to complete reports and other paperwork on time	3	TB
3. Feeling staff members don't understand my goals and expectations	2.75	RB
17. Having to make decisions that affect the lives of individual people whom I know (colleagues, staff members, students, etc.)	2.5	BS

The top five stressors have identical scores and could be reported in any order, as do the following three stressors. What is important to note is that the top five stressors are dominated by task based items, in accordance with the conclusions reached in the review of literature from this study. Another fascinating observation is that six of the top 10 stressors for public school principals are the same for Catholic school principals almost 40 years after the original study. That "Writing memos, letters, emails, texts, and other communications" and "Feeling that I have

to participate in activities outside of the normal working hours" have leapt into the top five speaks to the increased expectations for principals in the 21st Century (Combs & Edmonson, 2010; Sogunro, 2012; Wells, 2013).

The following additional stressors were collected during either the first or second surveys as stressors that principals felt were not specifically contained on the ASI. I have shortened responses not in quotations for brevity or clarity. I have also added categories and noted when the ASI does include the stressor.

Admissions. "Admissions work and the time this takes, especially in the Fall Semester."

Compliance. "Constant demands from DCS [Department of Child Services] and Archdiocese central office for updates and new programs related to child safety requirements, human resource requests, curriculum changes, etc. Complying with federal, state, and organizational rules is question 27 on the ASI.

Formation. "Keeping veteran teachers on task and enthusiastic about teaching ministry" and "tolerating faculty gossip about each other, parents, and students."

Frustrations. "Frustration with the pace of institutional evolution" and frequent impatience with nervous people.

Limited Resources. Fundraising for a multi-million dollar seismic upgrade and doing the custodial work because resources were allocated away from custodial for a reading specialist. Although trying to gain public approval or financial support for school programs is Question 35 on the ASI, this financial support related to a capital campaign, not a school program.

With the interview data having been coded, several new themes emerged, many of which were not contained in the survey responses: (1) Archbishop-Based Stress, with the sub-themes of

(a) Threat of Archdiocese regulation and (b) Defending Catholic reputation, (2) Mission-based stress, with the sub-themes of (a) Community-building and (b) Whole person formation, and (3) Financial stress, with the sub-themes of (a) Fundraising and (b) Enrollments. The following table summarizes the themes of the findings of this research question.

Table 25: Additional Stressors for Catholic School Principals

Theme	**Sub-theme**
Archbishop-based stress	Threat of Archdiocese regulation
	Defending Catholic reputation
Mission-based stress	Community building
	Whole person formation
Financial stress	Fundraising
	Enrollments

Archbishop-based stress

The category of Archbishop-based Stress includes all those stresses generated from public and private statements of the archbishop and his office, with the sub-themes of (a) Threat of archdiocese regulation and (b) Defending Catholic reputation.

Threat of Archbishop regulation. Threat of the Archbishop interfering in the operations of the school was common amongst several principals. As Antonio stated, "I think dealing with the archdiocese is a stress that most other independent schools don't deal with" (Roos, 2016, p.50). Particularly, the Archdiocese has been trying to influence private independent schools that do not fall directly under the authority of the Archbishop. Antonio explained:

> But I would think that especially given everything that going on in the past year with the Archdiocese trying to impose a little bit more, asserting its authority over the schools and imposing its own viewpoint on what constitutes Catholic identity and who should and shouldn't be teaching children in a Catholic school, I think has caused extra stress for principals that perhaps may not hold the same view. So, um, I think that adds stress. (Roos, 2016, p. 51)

The Archbishop and the private independent schools have been differing over what constitutes Catholicity and over who should be allowed to teach Catholic students. Concerning her fear of the Archbishop's imposition, Emily shared, "You want them [students] to feel imbued with meaning and purpose. And again, not, never in doctrinal way, but sometimes one is afraid that doctrine might be what's required at Catholic school" (Roos, 2016, p. 66). Emily was referencing the possible influence of the Archdiocese on her school's curriculum and pedagogy. Stuart summed up the feelings of his constituency:

> The negotiations with the Diocese ... have been really stressful over the last three years, like really intense. So, because people are very passionate about it, you know, so, we've had a lot happen down here in that regard, a lot of things to, sort of, negotiate that. (Roos, 2016, p. 11)

Stuart's negations with the Archdiocese have caused him stress for the past three years, not just over his control of his school but also by creating passion in others. In short, the principals were worried that they might have to act contrary to their principles in obeying the requirements of the Archdiocese.

Defending Catholic reputation. Because of the publicity of the Archbishop's contract negotiations with diocesan schools in the last year, principals have been fighting a public relations battle to defend the notion that their schools are ecumenical and socially just places for students. Jennifer delineated one instance where she failed to enroll a student because of the Archbishop's contract dispute:

> And everything with the contracts, like I still, even last week, somebody brought those contracts up to me, and I'm like really are we still talking about these? But a few parents that were not on a tour here, but we went, like, to different open houses. They said your school sounds great but we won't look at it because it's Catholic, because of, they feel that they couldn't trust that their child would be, I don't know, would get the support that they need based on what they've heard about the Archbishop. So I think that is an additional, additional stressor. (Roos, 2016, p. 92)

Several parents were so disappointed about the Archdiocesan contract dispute that they decided not to enroll their children in a Catholic school. Jennifer clarified the problem further; the word Catholic has a negative connotation for some parents:

> I think there's a lack of leadership in the Archdiocese, and I'm sure public schools have that with their own superintendents too, but I think that with what's going on with the priests and everything has added to a bit of negativity just about the word Catholic, so I know we've lost some interested applicants. (Roos, 2016, p. 92)

Jennifer believed that the negative reputation caused from the child abuse of priests combined with the lack of leadership of the Archbishop has negatively influenced her enrollments. Part of the challenge with defending the Catholicity of the school originates from the fact that the percentage of Catholic students enrolled in some Catholic schools is low. Stuart explained:

> So, but, you know, sort of defending Catholicity in the current milieu's an interesting space to live in because people have really strong feelings about it. And people who are, sort of, cradle Catholics understand the imperfection of the Church, like, you get the beauty and you get the horror, and you're trying to move towards the beauty, and people who aren't in the faith don't see the beauty all they see is the horror. And you're trying to say, look, this is, there's a lot to this, and in our population--only 30% of our kids are Catholic. (Roos, 2016, p. 11)

Part of Stuart's frustrations stem from people dwelling on the negatives of Catholicism without understanding its complexity, and because many of those people are not Catholics, they are less likely to understand its fullness. In Stuart's opinion, the cradle Catholics, i.e., those people who have been Catholic from birth, were more likely to be tolerant of the tensions in the Catholic Church.

Mission-based stress

The theme of Mission-based Stress, the stress originating from trying to implement the Catholic school mission, also emerged from the data. Wayne summarized this theme succinctly:

"I think the idea that we have high expectations around community, I think we have expectations on service, we have expectations on our faith development" (Roos, 2016, p. 25).

Community building. The first sub-theme was the stress that surrounded Community Building. Andrew explained this particular stress:

> I think, I'm not saying that public schools don't try to build, you know, community and have family programming and things like that but I just know that it's a, I feel like it's a higher priority at Catholic schools, and so that puts the focus, it expands the focus of what a principal's role is gonna be in kind of the family relationships. And not just like alright the students have their curriculum and they're working with the teachers and the students and great and, but it's like no, we're also supporting the family, and it's like there's a, that, that partnership and that sense of community that you need to be mindful of trying to you know build and then sustain, you know, and enhance. (Roos, 2016, p. 41)

Andrew felt that part of his job was to support the family and have relationships with them, and indeed this partnership is part of the mission of a Catholic school. Wayne elaborated on the challenges of developing a partnership with parents:

> And I, I think parents have higher expectations and sometimes unrealistic expectations, you know. I think parents are a little bit more challenging these days to respond to. They're partners working with us and we have to create a community that allows that to happen and that requires a lot of diligence and working with your staff, faculty, and parents. (Roos, 2016, p. 25)

The stress of working with parents in the context of building community stemmed from managing their unrealistic expectations and working with his faculty and staff to encourage that partnership. Additionally, fear of disrupting the community dwelt on Jennifer's mind:

> I think the, the stress, I think there's obviously, I feel there's much more community in a Catholic school, which is a blessing, and I think what we all love, but a principal has to walk more carefully in order to not like do anything that can rupture that community. (Roos, 2016, p. 92)

Jennifer understood the value of community, and her stress in this regard originated from the fear of doing something to undermine the community.

Margaret also weighed in on the stress that comes from building community. The close relationships that she had with her parents created an onus of responsibility:

> Well, if someone, you know, someone comes with a, you know, their marriage is falling apart. Does that happen in a public school? Very possibly, I don't know. But is it more tied to the values, I don't know. . . . Well it's just for me, it just, it just adds to the the burden that you carry. And not that it's a burden because it also adds to the, I mean sometimes I just feel so privileged that they chose to share this crisis in their live with me, not that I'm able, or humbled I guess, not that I'm able to help them, but it is a burden. Burden's not a good word because that's a negative word, but you do feel like you're, you know, you want to say the right thing, you want to do the right thing to help them. So that, that can be a challenge. (Roos, 2016, p. 77)

The desire to help parents when they came to her for help or advice was a challenge that existed for Margaret in her school. Similarly, Wayne took on the stress of some of his families: "The differences between the wealthy, the lower middle class, the middle class, a lot of stress there, a lot of stress in their families... I think all that comes in the mix, so, and we're in the middle of it" (Roos, 2016, p. 25). Balancing the disparity of wealth in his community and taking on the stress that those parents experience became an additional stressor for Wayne. He also pointed out that the challenges of communicating with new technologies has put a stressful strain on his community building attempts: "The impact of social media on how we communicate and how we understand each other and there's, I think there's some responsible moral issues around that, it's very important, very stressful as well" (Roos, 2016, p. 25). Social media impacted his community in such a way as to cause some more stressful situations.

Whole person formation. The second aspect of Mission-based stress originated from a desire to educate the whole child. Margaret discussed her reluctance to expel problem students because she felt morally obligated to help them as part of her mission:

> I think there's just that, that values piece, that morals piece, that, when you're dealing with things, you have to really remember who you're dealing with and, like there are a couple of kids, a couple families I'd like to say it's time for you to leave.... But I can't

> really say that....Well, because it's a Catholic school, we have to try and help people, we have to try and, you know, reach them and all that stuff where I'm about up to here with their nonsense, but I'm not going to just put them out, that kind of thing. (Roos, 2016, pp. 76-77)

Margaret had the additional stressor of problem children or problem families that she felt an obligation to help because helping to reach people, even the troubled ones, is part of the mission of the Catholic school.

Emily focused on the stress that came from the desire to imbue her students with a spiritual focus, another aspect of the Whole Person Formation sub-theme:

> I think it's certainly a big responsibility to fundamentally serve kids in a spiritual capacity, the ultimate metric of, you know, how well are you serving a kid to be a good thoughtful, compassionate, sincere human being, you know, and that being a core part of your mission, and also wanting to serve that for each child individually in terms of the wholeness and sanctity of each person, each young person. That's, that's important. And also just that fact that we are a Catholic independent school, so it's a little bit different perhaps but, you know, it's, it's the idea that, you know, these young people, they are questioning, they're struggling in so many different ways. It's a time in their life; they're adolescents. You want them to feel imbued with meaning and purpose. (Roos, 2016, p. 66)

Emily's desire for her impart her students with meaning and compassion and sincerity in the midst of their struggles weighed on her mind as an additional stressor for Catholic school principals that may not be shared with public school principals. However, Stuart felt that the spiritual focus of the Catholic school was not so much a stressor as it was a boon:

> The spiritual underpinnings for Catholic schools are becoming more resonant, particularly in Silicon Valley because people have, sort of, gone to Defcon 5 in terms of traditional achievement and the kids aren't doing very well, like, they're killing themselves in droves down here. So, so, it's easier down here, I think. (Roos, 2016, p. 11)

Because Stuart compared his school to the high pressure, high achieving schools in his area, he felt that his Catholic school was serving his constituency better because his school offered opportunities spiritual connectivity. Stuart explained his position further:

> I was a cop as a public school principal. Like, you're managing a lot, a much broader range of humanity, with no orienting principle. Like I came to the parochial side of things with a great deal of trepidation, but kids need to talk about God, even if they don't believe, like they need to engage with it. And I love the constant reminder that there's something bigger than you, and your little thing, and me, like, I need that message too. (Roos, 2016, p.10)

Stuart, who had previously worked as a public school principal, felt more aligned with his job as a Catholic school principal precisely because of the need to form the whole person, especially the spiritual side. He also described his experience as a Catholic school principal as being easier than that of a public school principal because of the Catholic school mission.

Financial-based stress

Principals felt that the stress from finances were unique to private schools, including the two sub-themes of a) Fundraising and b) Enrollments.

Fundraising. The onus of fundraising distressed those principals whose school were not flush with money. Wayne, who has been a principal for 15 years and has been in education for 35 years, explained:

> It's not like the old days where the tuition covered, you know, basically everything, it doesn't, uh, now, I mean you had nuns and you had lay people and everything. Now you gotta pay laity and you got to raise a whole lot of money, there's a lot of pressures financially, um, so I think those are some of the additional stressors. (Roos, 2016, p. 25)

Because Catholic schools no longer have the numbers of religious teaching at their schools, who were paid less than the lay teachers, tuition costs no longer cover the entire cost of running a Catholic school. Wayne, therefore, felt the pressure to fundraise and the stress that accompanies that pressure. Jennifer also experienced stress from the need to fundraise; if she does not raise enough money, her school will close:

> Right now principals in Catholic schools going through the seismic review versus principals in public schools it's night and day. Go raise five million, yeah, okay, for a Catholic school principal how are we gonna do that? In a public school the city will pay

> for it. That's not a stressor for them, they just say this is what has to be done and it's gonna get billed. With us our school will close if we can't raise the money. So I think that is very unique on the Catholic school principal. (Roos, 2016, p. 92)

She related that other elementary schools in the Archdiocese had the same fundraising demands, so she was not alone in her stress. As a first year principal, Jennifer felt so overwhelmed by the need to raise five million dollars that her only way to deal with it was to pretend that it was not an issue for this year. Concerning fundraising, Andrew feels that his stress is even more than that of other Catholic school principals, because his school is tuition free:

> My entire 15 career, 15-year career has been in Catholic schools like this, so it kind of, underserved, you know, communities, all kind of tuition free, so there's a level of stress of fundraising that exists you know at a Catholic school like … [mine] versus at a Catholic school like, you know, any of the other Catholic schools that have that like where tuition kind of helps with the fundraising. (Roos, 2016, p. 41)

Though Andrew did not directly participate in the fundraising, he still provided data to his team and still felt the stress from their pressure. However, both Stuart and Antonio taught at Catholic schools that had much better access to resources and did not feel stressed from the need to fundraise; Stuart even called the amount of resources available to his students "absurd" (Roos, 2016, p. 11). Both did acknowledge that the stress from the need to fundraise might be felt at other Catholic schools.

Enrollments. Admissions and enrollments came up thrice during the interview. Jennifer commented briefly, "And again public school, you're always going to have kids, you're always going to have a certain enrollment. With us it's really, it really just depends on what the reputation of the school is" (Roos, 2016, p. 92). She felt that in public schools, enrollments were not that big of an issue while in Catholic schools enrollments were linked to a school's reputation. She also felt that managing finances were a source of stress and that the availability

of resources stem from both enrollments and fundraising. In her survey response, Emily also mentioned that admissions work, especially in the fall, was a source of stress not included on the ASI.

Wayne also felt that enrollments were stressful because he was acutely aware of how closely his budgets were tied to his enrollments:

> The kind of work that we do in the Catholic schools, the finances, is very stressful. Enrollment, because there's a correlation between enrollment and finances. Generally speaking, your operating budget is about 85% of your enrollment. So, any time that you're operating within that, uh, both parameters, setting a budget, making cuts, you know, talking with parents around needs that they have economically, uh, repurposing teachers' roles. Those kinds of things can be very stressful, and typically those things are done towards the end of the year when, you know, you're, you're living a very busy year as it is. (Roos, 2016, p. 13)

Not only did Wayne feel stress from enrollments because his operating budget was so dependent on them, but the stress was exacerbated by the timing of the enrollment process at the end of the year.

Finally, Jennifer mentioned that admissions season is one of the three most stressful times of the year, with the start and end of the year being the other two times of stress. She described these three periods as "crunch time[s]" containing "peaks of stress" (Roos, 2016, p. 53).

In summary, the themes of (1) Archbishop-based stress, with the sub-themes of (a) Threat of Archdiocese regulation and (b) Defending Catholic reputation, (2) Mission-based stress, with the sub-themes of (a) Community-building and (b) Whole person formation, and (3) Financia-based stress, with the sub-themes of (a) Fundraising and (b) Enrollments, emerged from the interview data. Admittedly, only one principle, Stuart, had previously worked at a public school, so a fair comparison between public and Catholic school stressors is neither possible here

nor warranted. The themes above merely indicate the feelings and perceptions of Catholic school principals regarding stressors that they feel are unique to their experience.

Summary

The interview data, survey results, and journal entries of seven principals who participated in a pranayama intervention for a month indicate compelling effects and experiences in the area of perceived stress relief for educational leaders. Wayne, Andrew, and Stuart had the largest decreases in perceived stress as measured on the PSS, Jennifer had the largest decrease on the ASI, Margaret and Antonio had mixed results, and Emily's stress increased over the course of the intervention. A significant correlation emerged from the data indicating a correlation between average minutes of breathing per day and reduction of perceived stress as measured by the PSS. Concerning their experiences of practicing pranayama, the following themes emerged most clearly: 1) Novelty of pranayama, 2) Adjustment period to the practice, 3) Ease of implementation, 4) Alone time, 5) Benefits of practice, 6) Obstacles to the practice, 7) Shorter breathing sessions, and 8) Counting the breath. Concerning the comparison of the pranayama to other coping techniques, the following themes presented themselves: 1) Ambivalence, 2) Complementary benefit, 3) Efficiency, 4) Ease of location, and 5) Discipline. In telling their emotional narratives, the principals' responses fell into the following four themes: (1) No change, (2) Reduced emotion, and (3) Increased emotion. Finally, there were three categories of additional stressors for Catholic school principals: (1) Archbishop-based Stress, (2) Mission-based stress, and (3) Financial-based stress.

The conclusions reached by this researcher are presented in the next chapter. I have also included recommendations for both future research and future practice with some additional closing remarks.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

Because of the many demands on principals, including increased expectations for student achievement, limited resources, changing demographics, and the volume of communication demands from parents, board members, and faculty, principals are experiencing stress (Wells, 2013), and that stress can lead to burnout and illness (Allison, 1997; Olsen, 1984; Sogunro, 2012; Sytsma, 2009). Very few studies have investigated the stress in Catholic school principals, but those studies indicate that Catholic school principals do indeed experience high levels of stress as well (Costello, 1981; Fraser & Brock, 2006; McLaughlin, O'Keefe, & O'Keeffe, 1996). Regular pranayama practice has been shown to reduce perceptions of stress (Bhimani, Kulkarni, Kowale, & Salvi, 2011; Sharma, Rajajeyakumar, et al., 2014; Sharma, Takroo, et al., 2013), so this study sought to investigate and document the experiences of Catholic school principals who implemented a daily pranayama practice for one month, four sittings per day of eight minutes each.

This study utilized an embedded mixed methods design in which both qualitative and quantitative data were collected concurrently, with the quantitative data supporting and supplementing the qualitative data (Creswell, 2012). The participants were Catholic school principals of elementary or secondary schools from an Archdiocese in Northern California, including both diocesan and independent Catholic schools. Participants took the ASI and PSS at the start of the intervention and again after it was completed. They also kept a breathing, stress, and coping journal and answered questions in an interview.

Four principals experienced an encouraging decrease in perceived stress after the intervention, two principals showed mixed results, and one principal had a clear increase in perceived stress. The following themes emerged most clearly from the interviews about their experiences of practicing pranayama: 1) Novelty of pranayama, 2) Adjustment period to the practice, 3) Ease of implementation, 4) Alone time, 5) Benefits of practice, 6) Obstacles to the practice, 7) Shorter breathing sessions, and 8) Counting the breath. The following themes presented themselves from the comparison of pranayama to their other coping techniques: 1) Ambivalence, 2) Complementary benefit, 3) Efficiency, 4) Ease of location, and 5) Discipline. The principals' responses fell into the following four themes about their emotional narratives: (1) No change, (2) Reduced emotion, and (3) Increased emotion. Finally, there were three categories of stressors that principals felt were particular to Catholic school principals: (1) Archbishop-based stress, (2) Mission-based stress, and (3) Financial-based stress.

Conclusions and Implications

The following section is organized according to the five research questions of this study.

Research Question 1

To what extent is there a change in perceived stress after the pranayama intervention?

A significant correlation was found between average minutes of breathing per day and decrease in perceived stress as measured by the PSS, i.e. principals who recorded more minutes of breathing per day saw larger reductions in perceived stress. The implication is that pranayama can be a powerful tool for principals to reduce their perceived stress and that the more that a principal practices pranayama, the more benefits in perceived stress reduction he or she might experience. The only principal who was able to perform the intervention as it was designed with

32 minutes of breathing per day was Wayne, who averaged 31.7 minutes of breathing per day, and he experienced the second largest decrease in stress on the PSS (-9). Wayne, Andrew, and Stuart, all of whom were able to average over 20 minutes of breathing per day, not only reported amazing benefits vis-a-vis their perceived stress in their interviews but also scored lower on both the ASI and the PSS. The implication is that the pranayama practice is a power tool whose utility ought to be explored further.

There should be no aspersions cast on those participants who were not able to average 20 minutes of breathing, either for lack of discipline or commitment; principals are simply busy people, and most principals were unable to fully implement the intervention because of their busy schedules. Perhaps a future study can investigate a design for a pranayama practice that can be better integrated into the principals' busy lives, and new organizational structures should be considered to reduce the number of tasks that a principal is responsible for.

Those principals who indicated very little perceived stress at the start of the intervention, namely Margaret (PSS score of 10) and Antonio (PSS score of 12), also experienced very little change in perceived stress at the end of the intervention, 0 and -2 respectively, even with Margaret's sizeable average of 27 minutes of breathing per day. The implication could be that principals who are not experiencing much perceived stress do not receive the same degree of benefit from the pranayama practice as do principals who are experiencing more perceived stress. A pranayama intervention, while it may have other benefits, may not be the best coping technique for principals who are experiencing very little perceived stress.

The principals who recorded the least amount of breathing also had very little benefit in terms of perceived stress reduction. Jennifer recorded only an average 11.3 minutes of breathing

per day and Emily an average of 4.5 minutes per day, with PSS changes of -2 and +6 respectively. There might be a certain number of minutes of pranayama practice per day that is required before a principal will start to notice reductions in perceived stress.

Although the correlation between cycles per minute and change in the PSS was not significant (.52), that connection warrants further investigation in a future study. The principals in this study mostly found a breath ratio that they enjoyed and stuck with that ratio. Encouraging principals to work towards longer breath ratios that are fewer cycles per minute could maximize perceived stress reduction with fewer total minutes of breathing.

With the qualitative data from the principals regarding their perceived stress reductions having been examined, all principals but Margaret felt that the pranayama had a positive impact on their perceived stress and had a positive attitude towards the pranayama practice, and even Margaret used an adapted pranayama practice before stressful encounters. With principals experiencing high levels of stress irrespective of their gender, age, experience, or school size (Bradley, 2003; Monroe, 2007; Roesch, 1979; Welmers, 2005) and with the correlation between stress and burnout among principals (Olsen, 1984; Gmelch & Torelli, 1993; Shumate, 1999), coping techniques that reduce stress efficiently among principals are desperately needed. These very positive responses from this study and the correlation between average minutes per day and perceived stress reduction on the PSS suggest that the Ujjayi pranayama technique, even in an adapted form, might be a useful and effective coping technique for other populations of principals.

Research Question 2

What was the experience of the pranayama practice for Catholic school principals?

All seven principals who participated in this study reported having a positive feeling about the pranayama practice, and many reported having benefits with respect to their stress, benefits ranging from relaxation and calm, increased focus, a reduced incidence of negative emotions, and a better sense of pace for their busy day. Three principals also reported that the implementation of the practice was easy. The confluence of these positive themes suggest that the intervention was a beneficial experience for these principals and may be a beneficial experience other principals as well.

Wayne reported deeper reflections and three other principals reported better focus. These observations on focus corroborate Hayes and Chase's (2010) supposition on how yoga practices function to reduce stress, namely by creating an inward focus that buffers the individual from the external factors that may be stimulating the stress response. The relaxation and calm as well as the incidence of reduced negative emotion give support to the postulates of Brown and Gerbarg (2005), who supposed that pranayama works by producing oxytocin and prolactin to stimulate calmness and stimulates areas of the limbic brain to produce an emotional release.

Some principals spoke to requirement for and benefit of having some alone time during the course of the busy school day. Sytsma (2009) argued that leaders need the time to work on inner change to be better leaders, and the pranayama practice, in allowing principals alone time, better focus, and reflective capacity, affords principals an opportunity for the inner alchemy of reflection.

Performing an Ujjayi pranayama intervention was a new experience for all the principals in the study, and several principals reported that it took some time to adjust to the practice or integrate the practice into their routines. Three principals also reported having trouble producing the Ujjayi sound. These results suggest that one initial training session may have been insufficient for inculcating the Ujjayi technique. In future interventions or in training sessions, a follow-up instructional meeting may be needed to both answer any questions that principals have and to help solidify the practice of the technique. Conrad and colleagues (2007) highlighted the importance of and difficulties associated with breathing instructions. Although the Ujjayi technique is not a necessary requirement for stress reduction (Ghiya & Lee, 2012; Mason, et al., 2013), it is a helpful tool for valving and controlling the speed of the breath (Brown & Gerbarg, 2005).

Some obstacles to the practice cannot be helped or prevented. The use of the Ujjayi technique may not be the best pranayama to use for those principals who have bad allergies or have congestion issues, and perhaps other techniques like *shitali* or *shitkari* pranayama (Kraftsow, 2002) or some other adaptation of mouth-breathing could be explored for these principals. Falling asleep during the practice, although this outcome is an obstacle to the practice itself, might serve as a benefit to principals who are suffering from insomnia or exhaustion. With principals working an average of 58 hours per week (Carson, 2010), it is not surprising that exhaustion can interfere with principals who practice pranayama.

The discipline required for doing the pranayama practice must be considered more deeply by principals before endeavoring on a formal intervention vis-a-vis the effectiveness of this coping technique. Both Antonio and Emily voiced their struggles with the discipline of doing

the practice, and Andrew had doubts about continuing the practice after the encouragement from formal intervention had ended. Brainstorming ways of supporting regular pranayama practice must be a consideration for future researchers, and principals who practice pranayama regularly could shared their best practices.

Some obstacles to the practice can be lessened. Outside interruptions for principals who are breathing at work cannot be eliminated completely because there may be genuine emergencies that a principal must deal with; however, outside interruptions may be lessened. Jennifer had her secretary helping her secure some alone time, Andrew let his staff know to respect the time he allocated for breathing, and Wayne actually left work at times to breathe. These strategies and others ought to be taught to principals before a breathing intervention is undertaken.

The shorter breathing sessions that four principals concurrently used suggest a new use for pranayama practice and a new way that principals can use the breath. Specifically, an additional coping technique that can be taught to principals is a shorter breathing practice in which they take several long, deep breaths before entering into stressful encounters or meetings. This technique can be added to the list that Shumate (1999) catalogued, the coping that principals used for such encounters: consulting with their colleagues, delegating, or changing eating and sleeping habits

The different counting techniques, with or without metronome, with a clock, with a visualization of a swimming practice, using the hand, etc. used by principals can inform how they are taught to breathe in a pranayama intervention, i.e. principals can be given choice in how to count the breath. Andrew felt that the counting of the breath with the metronome produced

focus and calm, and this observation may coincide with metronome breath stabilization during cycling that was noticed by Bardy and colleagues (2015). However, the big drawback in analyzing cycles per minute of the breath during pranayama in this study is that there was no way to insure comparable data if the counting was not uniform with a precise counting device. Even though a large but non-significant correlation was found between cycles per minute and reduction in perceived stress (.52), the fact that different principals were counting differently calls this correlation into question, and future studies wishing to investigate this link should have participants count their breath with an accurate and precise external device.

The lack of time voiced by five of the principals is a legitimate concern, especially if they do not have time for eight minutes of rest to practice pranayama during the middle of a typical work day. Leo XIII (1891) declared that worker hours should not extend beyond an individual's strength to manage the job and that it is just to allow for proper rest of mind and soul. Because principals in this study were often unable to find eight minutes during the school day to breathe, we must question the expectations that are placed on our principals in light of Leo XIII's requirements for the dignity of all workers, especially our principals.

Research Question 3

What other coping techniques do principals at Catholic schools use and how do the principals compare the effectiveness of the pranayama practice to their other coping techniques?

Using the categories of coping techniques from the Coping Response Inventory (Gmelch & Chan, 1994), the researcher collated the responses of the principals. Physical activity was the most frequently recorded coping category and was used by all seven principals. Five principals used social coping techniques, four used personal interest coping, three used managerial coping,

two used entertainment, and only one used attitudinal and intellectual stimulation. Because the Coping Response Inventory was not given to the principals in this study, principals may have been using other techniques for coping that they did not record in their journals or mention in their interviews because they may have been unaware that those activities were indeed coping strategies, i.e. there could have been an under-reporting of coping (Folkman & Moskowitz, 2004). Another possibility is that many of the principals in this study had only a few coping techniques to draw from in dealing with stress. Margaret and Antonio expressed this opinion. In either case, Catholic principals should receive more training in stress coping so that they can have either more awareness about what they are already doing or more options for coping with their stress. In light of Allison's (1997) findings that principals with higher stress scores had a more limited repertoire of coping techniques and used these techniques less frequently, Catholic school principals would benefit from the knowledge of a wide range of coping techniques.

Only Wayne consciously used prayer and mass, specifically Catholic methods of coping. Principals who identify as Catholic could also be using these techniques to cope, and stress coping training for Catholic school principals could include them as well.

Of the themes that the researcher discovered from the participants in response to comparing the pranayama practice to other coping techniques, only two should give us pause: ambivalence and discipline. Only Margaret was ambivalent, mostly because of her cost-benefit analysis with respect to the pranayama practice: she did not receive much stress relief for the amount of time required for breathing. As postulated earlier, this lack of benefit might have been caused from her low level of perceived stress. The discipline required for the practice is an obstacle shared with other coping techniques like exercise, prayer, or managerial techniques, and

the development of discipline for stress coping is a skill that ought to be inculcated in principals generally. Principals felt that the pranayama practice made their other stress coping endeavors more effective, and other researchers ought to explore this complementary benefit further because the ramifications could be prodigiously helpful to principals if such an effect can be shown. The other themes that emerged, namely, the efficiency of the perceived stress reduction benefit and the fact that one can practice pranayama almost anywhere, suggest that there is a utility and an ease of implementation to using Ujjayi pranayama as a coping technique.

Research Question 4

What narratives are the principals able to tell about their emotions during the intervention? Is their emotional state different after the intervention? To what extent does pranayama help with emotion focused coping and emotion regulation?

Concerning the breathing journals that principals were asked to keep, only three principals were able to record their emotions with any degree of daily rigor. Wayne had 37 emotional entries, Jennifer 31, and Stuart 23. Margaret, Andrew, and Antonio recorded their emotions only 13, 6, and 2 times respectively. I was hoping for more data from this source, especially data that might show a change in emotional state over time.

However, several principals did have some powerful stories to recount in the interviews, especially with regards to a reduction in anger, anxiety, and emotional intensity. These data are consistent with Betal's (2015) theory on how pranayama works, namely by directly reducing limbic system arousability, causing emotional reactions to come under control automatically. Because of the role of emotion in the stress response, i.e, because strong negative emotions directly lead to the perception of stress (Lawrence, Troth, Jordan, & Collins, 2011; Lazarus,

2006; Wang & Saudino, 2011), this pranayama intervention with principals, in reducing anger, anxiety, and emotional intensity, may have operated to reduce the stress response via the mechanism of calming emotions. In their sample of principals, Poirel and Yvon (2014), found that anger and anxiety were the most commonly experienced emotions. With three principals reporting a reduction in anger, four a reduction in anxiety, and three a reduction in the intensity of their emotional experience, this pranayama intervention has shown itself to be a useful tool for emotion regulation. Because emotions have been shown to influence the decision-making process, the relationship the principal has with his or her staff, and the emotional climate of the entire school (Brennan & Mac Ruairc, 2011), coping techniques that provide emotion focused coping for principals are needed at Catholic schools to insure better decision-making, better principal-staff relations, and a better school climate. Pranayama might also be useful in preventing burnout because emotion regulation strategies have been shown to prevent burnout in the workplace (Scheibe & Zacher, 2013).

In the discussion of the theme of Emotional Access, Stuart was able to feel emotions that he had otherwise suppressed, specifically emotions of sadness about the loss of his mother. The Sacred Congregation for Catholic Education (2007) expressed their opinion that the Catholic school is a place for "forming the person in the integral unity of his being," and if the pranayama practice had the effect of reuniting Stuart with his emotions, then it can be seen as useful tool for formation in Catholic schools.

Research Question 5

To what extent are there additional sources of stress for principals at Catholic schools?

Two of the three identified themes may be particular to the Catholic context, namely Archbishop-Based Stress, produced from the Church hierarchy, and Mission-Based Stress, produced from a desire to fulfill the specific mission of Catholic schools. The third theme, Financial-Based Stress, is certainly shared by other public school and private school principals. Both public school principals and private school principals have fundraising concerns, and other private school principals certainly worry about enrollments.

Future survey instruments that evaluate stressors in Catholic school principals may want to include the following stressors based on the themes uncovered in this study: "Complying with Archdiocesan/Diocesan rules and regulations" (BS), "Trying to gain approval from prospective applicants and their families" (BS), "Trying to gain financial support from prospective donors" (BS), "Trying to build community within the school" (TB), "Feeling that I am responsible for educating the whole child" (RB), and "Feeling that I have to meet enrollment expectations" (RB).

Because Catholic school principals talked about some of their biggest stressors being non-work-related stressors, future researchers may also want to include Personal Life stress (PL) as a category of stress to measure. Antonio felt the largest stress from helping his mother when she was sick, Stuart felt that stress from issues around his wife and child were his biggest stressor five times in a month, Andrew mentioned his wife's stress as his biggest stressor as well as not being able to be present for his family as a stressor, Emily felt stress from trying to maintain a healthy work-life balance, and Jennifer experienced stress from trying to get her personal life in

order. This confluence of PL themes from a majority of the principals in this study suggest that PL stressors should be ascertained as well in future studies.

In some ways, the fact that Catholic school principals are experiencing Mission-Based Stress is a promising result because it implies that they are aware of the mission of Catholic schools and are attempting to fulfill it. Catholic documents emphasize the need for Catholic schools to build community and educate the whole person (Sacred Congregation for Catholic Education, 1982; Sacred Congregation for Catholic Education, 2007). Principals in this study were aware of the mission and were trying to implement it.

Because of the stressors uncovered stemming from the Church hierarchy, dioceses should begin to explore ways in which they can be more supportive of their schools in order to change the perception that they are simply a regulatory body. They may also wish to change the focus of their involvement in schools away from regulation and more towards support. Jennifer was tasked with raising millions of dollars for an earthquake retrofit, a task that she does not yet know how to perform. Sending her to professional development training around fundraising, introducing her to fundraising mentors within the Archdiocese, and performing some or all of the fundraising on her behalf could be ways in which support could be granted and stress could be alleviated.

Moreover, financial-based stress stemming from the pressure to enroll students who can pay the full tuition may continue to be a problem for principals into the future if the current model of tuition reliance remains unchanged. Catholic schools should explore other models of financing their schools that could include grants from non-profit and for-profit corporations,

support and fundraising from dioceses, and work-study and apprenticeship models whereby students earn revenue to pay for the cost of education.

Recommendations

Recommendations for Future Research

Based on a thorough literature search, this study appears to be the only study focusing on a breathing intervention for Catholic school principals. I would hope that this study invites other researchers to look at stress coping using pranayama for principals, teachers, students, and parents in both Catholic and secular educational settings; I consider items one through three most important vis-a-vis this study and Catholic school administrators:

1) Larger survey-based studies ascertaining the levels of stress experienced by Catholic school administrators in other geographical regions in the United States. Data concerning Catholic school administrator stress needs to be brought to light so that pastors, bishops, boards, presidents, and principals themselves can take actions to support Catholic school principals.
2) Larger Ujjayi pranayama intervention studies utilizing a wait-list control group for principals in Catholic, private, or public schools. A proper experimental design is needed to add some quantitative data to the study of pranayama in administrators.
3) Stress coping interventions for administrators investigating the minimum number of minutes of daily pranayama required to produce a significant reduction in perceived stress. This information would help refine the implementation of pranayama for principals.

4) Larger studies ascertaining the coping mechanisms of Catholic school principals using the Coping Response Inventory (Gmelch & Chan, 1994) or another similar coping inventory.
5) Studies investigating a link between stress and burnout in Catholic school administrators (cf. Shumate, 1999; Costello, 1981).
6) Stress coping intervention studies utilizing physiological indicators of stress (rather than perceptions of stress) in administrators, teachers, and students.
7) Stress coping interventions for administrators utilizing different lengths or different times of a daily pranayama intervention.
8) Stress coping interventions for administrators utilizing other pranayama techniques, e.g. alternate nostril breathing.
9) Stress coping interventions for administrators utilizing other mindfulness practices.
10) Studies investigating the complementary benefit of pranayama with other coping techniques.
11) Stress coping intervention studies for teachers using Ujjayi pranayama.
12) Stress coping intervention studies for students using Ujjayi pranayama.
13) Pranayama intervention studies for classrooms investigating effects on stress, test anxiety, emotional regulation, and/or classroom behavior.
14) Studies investigating the effectiveness of different pranayama ratios with both perceptions of stress and physiological indicators of stress, e.g., breathing with an exhale that is twice the length of the inhale.

15) Studies investigating the correlation between cycles per minute of pranayama and changes in perceived stress.
16) Larger experimental studies investigating a possible link between pranayama and reduction of task-based stress (as well as the other types of stress on the ASI).
17) Experimental studies investigating a link between pranayama practice and burnout.

Recommendations for Future Practice

At the start of the study, Andrew and Jennifer were experiencing high stress as indicated by the PSS and Wayne scored in the second highest quintile on the ASI while other principals were experiencing moderate or even low stress as indicated by these tests. Any measures that can be taken to reduce the stress in Catholic school principals should be attempted so that they can lead better, more justly, and with less negative emotion.

With the stress that comes from the increased expectations and expanding complexity of the principal's job (Combs & Edmonson, 2010; Sogunro, 2012), the principal's job may no longer a sustainable position for just one person, and new models of school administration and leadership ought to be vetted for Catholic schools. Stress coping techniques may just be a bandaid for a larger structural problem within the school organization, and Catholic schools should explore alternative models of leadership, including those utilizing two or more co-principals, head-teachers, and distributed leadership (Grubb & Flessa, 2006).

With these ideas in mind, I would like to make the following recommendations for future practice:

1) That trainings and professional development for Catholic school principals include stress management and stress coping techniques.
2) That trainings and professional development for Catholic school principals include emotion regulation and attention allocation strategies for emotion focused coping.
3) That Catholic school principals educate themselves on the consequences of stress so that they can realize when their stress has become too high and take appropriate action.
4) That Ujjayi pranayama be taught to principals as one of many coping techniques that they can use.
5) In order to reduce distractions and fragmentations on their job, that principals might do things, such as install shades or blinds on the windows to their offices and use a sign on their door that communicates that the principal is taking alone time.
6) That principals implement a 5-minute schoolwide breathing practice at the start of assemblies or chapels so that principals, students, and faculty can receive the benefit of a brief pranayama practice.
7) That alternate leadership structures that reduce the workload on administrators be explored and implemented.
8) That principals enlist the support of their staff to take 10 minutes of daily, uninterrupted alone time with which they can reflect, meditate, or breathe during the work day.

9) That the supervisors of Catholic school principals hold their principals accountable for regularly practicing some form of effective stress coping technique, whether it be pranayama or some other proven technique, and accountable for taking an uninterrupted rest during the school day.
10) That dioceses and archdioceses discontinue the practice of regulating morality among their employees and in their employment practices.
11) That dioceses and archdioceses research ways with which they can better support their principals and implement the results of their research.

Closing Remarks

The narratives, survey responses, and journal logs represent the diverse experiences of seven Catholic school principals in regards to their perceptions of stress and their attempts to mitigate that stress. The number of stressors that Catholic school principals must endure, especially the sheer volume of task-based stressors that they must navigate, speaks to the service that these principals are performing on behalf of Catholic education.

I was hoping that this intervention would be transformative in the lives of the principals and that they would begin to practice pranayama regularly after the intervention had ended, and indeed the intervention was helpful for a majority of the principals for the duration of the study. Indeed, the feedback from Wayne, Andrew, and Stuart about how their relationship with both stress and emotion was altered as a result of the intervention was profound; their lives were certainly changed for the better. Wayne intended to continue a pranayama practice after the study, and several others indicated a desire to do so as well. Andrew has even partnered with an organization to teach breathing to his entire student body. However, the large demands on time

of all seven principals as well as the discipline required to maintain a regular breathing practice decrease the chances of a pranayama practice being implemented regularly.

Formation consists of a "competency in a wide range of cultural, psychological, and pedagogical areas" (Sacred Congregation for Catholic Education, 1982), and The United States Conference of Catholic Bishops (2005) stated that “the preparation and ongoing formation of new administrators and teachers is vital if our schools are to remain truly Catholic in all aspects of school life.” I believe that learning and practicing pranayama can be seen as an aspect of the call to formation, and if indeed a pranayama does increase the effectiveness of other coping strategies, then it is truly a gem amongst stress coping techniques.

It is still my hope that this study might be one small step in normalizing the very powerful and transformative practices from the yoga tradition so that people from all traditions and faiths can benefit from them, and I hope that I have shown that Catholic school principals can be successful at stress reduction through pranayama. It is my belief from my experiences with this study and my own practice of pranayama that a pranayama practice can benefit administrators, faculty, students, and parents, and I would like to encourage administrators to teach pranayama to their faculty, faculty to teach pranayama to their students, and students to teach pranayama to their parents.

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APPENDICES

Appendix A

Email to Principals or Presidents

Dear Mr. or Ms. _____,

I am conducting a study for my dissertation at University of San Francisco where I am currently enrolled at the Institute for Catholic Educational Leadership (ICEL). The purpose of this study is to examine the effectiveness and experience of a yoga breathing intervention on perceived levels of stress. I would deeply appreciate your participation in this research study. Having observed my principal, I am fully aware of the time demands placed on you during the course of the day. However, I am hopeful that you will help me in my research project. This study will benefit Catholic school principals in determining the effectiveness and best practices of a yoga breathing intervention for stress.

The time commitment for the study will be a 20-minute questionnaire at the start of the study, and a 20- to 30-minute lesson on yoga breathing. You will then practice yoga breathing 32 minutes daily for the next month: four times a day for eight minutes each time, once in the morning, once before lunch, once before dinner, and once before bed. I will ask you to record your times and any reflections in a google sheet (or in a journal, if that is preferable) at night before bed. At the end of the two months of practice, you will complete the same survey again and we shall meet in your office (or another place that is convenient) for a 20- to 30-minute follow-up interview about your experience.

Your participation in this study is strictly confidential. I will be the only person who will have access to your identity and to information associated with your identity. Your participation

is voluntary and you may decline to answer any of the questions if you choose. If you have any questions about this email, do not hesitate to call me at (415) 378-1132. Your participation is essential to my research project and will contribute to research in the area of Catholic school principals and stress.

Appendix B

Permission to Use the Administrator Stress Index

From: Scott Roos [mailto:scottroos@gmail.com]
Sent: Sunday, January 31, 2016 2:53 PM
To: Walter H Gmelch <whgmelch@usfca.edu>
Subject: Permission to use the ASI

Dear Dr. Gmelch,

I'm wondering if I can secure your permission to use the Administrator Stress Index for my doctoral dissertation entitled *The Experience of Principals at Catholic Schools Implementing a Pranayama Practice for Stress Coping* at the University of San Francisco Institute for Catholic Educational Leadership.

Thanks so much,

Scott Roos
415-378-1132 (cell)

From: **Walter H Gmelch** <whgmelch@usfca.edu>
Date: Mon, Feb 1, 2016 at 9:48 AM
Subject: RE: Permission to use the ASI
To: Scott Roos <scottroos@gmail.com>

Dear Scott:

I hereby give you permission to use the ASI in your dissertation at USF.

Best of luck with your research!

Walt Gmelch
Professor of Organization and Leadership
School of Education
University of San Francisco
(415) 422-5434

Appendix C

Permission to use the Perceived Stress Scale

Dr. Cohen's Scales:

We welcome copies (e-mail is OK) of any in press or published papers using any of Dr. Cohen's scales that you are willing to share with us, and thank you in advance for your generosity. They will not be redistributed or linked without your permission.

Permissions: Permission for use of scales is not necessary when use is for nonprofit academic research or nonprofit educational purposes. For other uses, please contact the lab at commoncoldproject@andrew.cmu.edu for instructions.

Retreived from http://www.psy.cmu.edu/~scohen/scales.html

Appendix D

The Perceived Stress Scale

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate your response by placing an "X" over the circle representing HOW OFTEN you felt or thought a certain way.

	Never 0	Almost Never 1	Sometimes 2	Fairly Often 3	Very Often 4
1.In the last month, how often have you been upset because of something that happened unexpectedly?	○	○	○	○	○
2.In the last month, how often have you felt that you were unable to control the important things in your life?	○	○	○	○	○
3.In the last month, how often have you felt nervous and "stressed"?	○	○	○	○	○
4.In the last month, how often have you felt confident about your ability to handle your personal problems?	○	○	○	○	○
5.In the last month, how often have you felt that things were going your way?	○	○	○	○	○
6.In the last month, how often have you found that you could not cope with all the things that you had to do?	○	○	○	○	○
7.In the last month, how often have you been able to control irritations in your life?	○	○	○	○	○
8.In the last month, how often have you felt that you were on top of things?	○	○	○	○	○
9.In the last month, how often have you been angered because of things that were outside your control?	○	○	○	○	○
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	○	○	○	○	○

PSS-10 scores are obtained by reversing the scores on the four positive items, e.g., 0=4, 1=3, 2=2, etc. and then summing across all 10 items. Items 4, 5, 7, and 8 are the positively stated items.

Retrieved from http://www.psy.cmu.edu/~scohen/scales.html

Appendix E

Google Sheets Journal Template

Date	Minutes Pranayama				Breathing Ratio	Biggest Stressor?	Any strong emotions associated with biggest stressor?	Other Coping Strategies Used?	Notes on Pranayama Experience/Additional Practice?
4/1/2016	8	8	8	8	6:0:6:0	Example Stressor	Example Emotion	Example Coping	Example Notes
4/2/2016									
4/3/2016									
4/4/2016									
4/5/2016									
4/6/2016									
4/7/2016									
4/8/2016									
4/9/2016									
4/10/2016									

Appendix F

The Administrator Stress Index

School Administrators have identified the following 35 work-related situations as sources of concern. It's possible that some of these situations bother you more than others. How much are you bothered by each of the situations listed below? Please click the appropriate response.

	Not Applicable	Rarely or Never Bothers Me		Occasionally Bothers Me		Frequently Bothers Me
1. Being interrupted frequently by telephone calls	NA	1	2	3	4	5
2. Supervising and coordinating the tasks of my people	NA	1	2	3	4	5
3. Feeling staff members don't understand my goals and expectations	NA	1	2	3	4	5
4. Feeling that I am not fully qualified to handle my job	NA	1	2	3	4	5
5. Knowing I can't get information needed to carry out my job properly	NA	1	2	3	4	5
6. Trying to resolve differences between/ among students	NA	1	2	3	4	5
7. Thinking that I will not be able to satisfy the conflicting demands of those who have authority over me	NA	1	2	3	4	5
8. Feeling not enough is expected of me by my supervisor	NA	1	2	3	4	5
9. Having my work frequently interrupted by staff members who want to talk	NA	1	2	3	4	5

10. Imposing excessively high expectations on myself	NA	1	2	3	4	5
11. Feeling pressure for better job performance over and above what I think is reasonable	NA	1	2	3	4	5
12. Writing memos, letters, emails, texts, and other communications	NA	1	2	3	4	5
13. Trying to resolve differences with my superiors	NA	1	2	3	4	5
14. Speaking in front of groups	NA	1	2	3	4	5
15. Attempting to meet social expectations (housing, clubs, friends, etc)	NA	1	2	3	4	5
16. Not knowing what my supervisor thinks of me, or how s/he evaluates my performance	NA	1	2	3	4	5
17. Having to make decisions that affect the lives of individual people whom I know (colleagues, staff members, students, etc.)	NA	1	2	3	4	5
18. Feeling I have to participate in school activities outside of the normal working hours at the expense of my personal time	NA	1	2	3	4	5
19. Feeling that I have too much responsibility delegated to me by my superior	NA	1	2	3	4	5
20. Trying to resolve parent/school conflicts	NA	1	2	3	4	5
21. Preparing and allocating budget resources	NA	1	2	3	4	5
22. Feeling that I have too little authority to carry out responsibilities assigned to me	NA	1	2	3	4	5

23. Handling student discipline problems	NA	1	2	3	4	5
24. Being involved in the collective bargaining process	NA	1	2	3	4	5
25. Evaluating staff members' performance	NA	1	2	3	4	5
26. Feeling that I have too heavy a workload, one that I cannot possibly finish during the normal work day	NA	1	2	3	4	5
27. Complying with state, federal, and organizational rules and policies	NA	1	2	3	4	5
28. Feeling that the progress on my job is not what it should or could be	NA	1	2	3	4	5
29. Administering the negotiated contract (grievances, interpretation, etc.)	NA	1	2	3	4	5
30. Being unclear on just what the scope and responsibilities of my job are	NA	1	2	3	4	5
31. Feeling that meetings take up too much time	NA	1	2	3	4	5
32. Trying to complete reports and other paperwork on time	NA	1	2	3	4	5
33. Trying to resolve differences between/among staff members	NA	1	2	3	4	5
34. Trying to influence my immediate supervisor's actions and decisions that affect me	NA	1	2	3	4	5
35. Trying to gain public approval and/or financial support for school programs	NA	1	2	3	4	5

Appendix G

Participant Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Below is a description of the research procedures and an explanation of your rights as a research participant. You should read this information carefully. If you agree to participate, you will sign in the space provided to indicate that you have read and understand the information on this consent form. You are entitled to and will receive a copy of this form.

You have been asked to participate in a research study entitled THE EXPERIENCE OF PRINCIPALS AT CATHOLIC SCHOOLS IMPLEMENTING A PRANAYAMA PRACTICE FOR STRESS COPING conducted by Scott Roos, a doctoral student in the Department of Leadership Studies at the University of San Francisco. This faculty supervisor for this study is Walter Gmelch, a professor in the Department of Leadership Studies at the University of San Francisco.

WHAT THE STUDY IS ABOUT:
The purpose of the study is to explore the phenomena of principals at Catholic schools who implement a pranayama practice and to investigate these principals' perceptions of its utility as a coping technique, the changes in the principals' perceptions of the sources of stress and levels of stress, and the principal's ability to slow the breath over time. The study also seeks to narrate how principals report their emotions vis-a-vis their perceptions of stress and to determine if principals at Catholic schools have sources of stress other than those of public school principals.

WHAT WE WILL ASK YOU TO DO:
At the start of the study, you will take a survey collecting demographic data and asking you about frequency that you are bothered by different sources of stress. You will be trained in pranayama (yoga breathing), and then you will practice the breathing four times a day for eight minutes each sitting (before breakfast at home, before lunch at work, before dinner, and before bed). Every night before bed you will record your minutes of breathing, average breath ratio, biggest stressor, emotion connected with the stressor, other coping, and notes in a google spreadsheet provided by the researcher. At the end of the intervention, you will take a survey and answer interview questions.

DURATION AND LOCATION OF THE STUDY:
Your participation in this study will involve one month of practicing pranayama four times per day (before breakfast at home, before lunch at work, before dinner, and before bed) for eight

minutes each sitting (a total of 32 minutes per day). You can practice at your home and your school, and the interview can take place at your office or at any other quiet location that you find amenable.

POTENTIAL RISKS AND DISCOMFORTS:
We do not anticipate any risks or discomforts to you from participating in this research. If you wish, you may choose to withdraw your consent and discontinue your participation at any time during the study without penalty.

BENEFITS:
The possible benefits to you of participating in this study are reduced stress, reduced anxiety, reduced depression, greater ability to focus, mental calm, better emotion regulation, less emotional exhaustion, and more energy.

PRIVACY/CONFIDENTIALITY:
Any data you provide in this study will be kept confidential unless disclosure is required by law. In any report I publish, I will not include information that will make it possible to identify you or any individual participant. Specifically, I will collate the transcriptions of the interviews into a single document entitled "Transcripts from Roos Dissertation" and they will be stored in a secure location in the my home for seven years after the research has taken place and in my google drive which is password protected. The pranayama journals will also be stored in my password protected google drive for seven years after the completion of the study, at which time they will be destroyed. Interview audio data will be stored on my computer, which is password protected for a period of seven years, at which time they will be destroyed. In writing up the research, I will use pseudonyms for the participants and will not identify the schools at which the principals worked.

COMPENSATION/PAYMENT FOR PARTICIPATION:
There is no payment or other form of compensation for your participation in this study.

VOLUNTARY NATURE OF THE STUDY:
Your participation is voluntary and you may refuse to participate without penalty or loss of benefits. Furthermore, you may skip any questions or tasks that make you uncomfortable and may discontinue your participation at any time. In addition, the researcher has the right to withdraw you from participation in the study at any time.

OFFER TO ANSWER QUESTIONS:
Please ask any questions you have now. If you have questions later, you should contact the principal investigator: Scott Roos at 415-378-1132 or scottroos@gmail.com. If you have

questions or concerns about your rights as a participant in this study, you may contact the University of San Francisco Institutional Review Board at IRBPHS@usfca.edu.

I HAVE READ THE ABOVE INFORMATION. ANY QUESTIONS I HAVE ASKED HAVE BEEN ANSWERED. I AGREE TO PARTICIPATE IN THIS RESEARCH PROJECT AND I WILL RECEIVE A COPY OF THIS CONSENT FORM.

Participant Signature _____ *Date* _____

Appendix H

IRB Approval

From: Terence Patterson <noreply@axiommentor.com>
Date: March 15, 2016 at 8:30:28 AM PDT
To: whgmelch@usfca.edu
Subject: Expedited Review Approved by Chair - IRB ID: 607
Reply-To: Terence Patterson <irbphs@usfca.edu>

IRBPHS - Approval Notification

The Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco (USF) has reviewed your request for human subjects approval regarding your study.

Your research (IRB Protocol **#607**) with the project title **THE EXPERIENCE OF PRINCIPALS AT CATHOLIC SCHOOLS IMPLEMENTING A PRANAYAMA PRACTICE FOR STRESS COPING** has been approved by the IRB Chair under the rules for expedited review on **03/15/2016**.

Any modifications, adverse reactions or complications must be reported using a modification application to the IRBPHS within ten (10) working days.

If you have any questions, please contact the IRBPHS via email at IRBPHS@usfca.edu. Please include the Protocol number assigned to your application in your correspondence.

On behalf of the IRBPHS committee, I wish you much success in your research.

Sincerely,

Terence Patterson, EdD, ABPP

Professor & Chair, Institutional Review Board for the Protection of Human Subjects

University of San Francisco

irbphs@usfca.edu

https://www.axiommentor.com/pages/home.cfm